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*From the author.*

OBSERVATIONS  
ON  
THE TESTICLES.

## THE LITERATURE

604/27.

## OBSERVATIONS

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## THE TESTICLES.

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BY

JAMES RUSSELL, F.R.C.S.

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UNIVERSITY OF EDINBURGH, VICE-PRESIDENT  
OF THE ROYAL SOCIETY OF EDINBURGH,  
*&c.*

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TO

THE PRESIDENT AND FELLOWS OF THE  
ROYAL COLLEGE OF SURGEONS.

*Mr PRESIDENT and GENTLEMEN,*

*I most thankfully embrace the present occasion to acknowledge my obligations to the Royal College of Surgeons for the patronage afforded to the Class of Clinical Surgery. I rejoice with unfeigned satisfaction at having, under their auspices, been the instrument of establishing a most valuable system of professional practical instruction. And I should be guilty of unpardonable ingratitude were I to omit giving all due praise to the Fellows of the College, in their individual capacity, for the facilities and support granted me to promote the success of the undertaking. Allow me, at the same time, to congratulate the College on the prosperous change which has taken place since I became a Fellow, more than fifty years ago. It*

*is gratifying to consider the decided part which the College has taken in promoting the advancement of Medical Science. And from the zeal displayed in building a magnificent Hall, and at great expense collecting a splendid Museum, open to public inspection ; from the industry, intelligence, and laudable spirit of the Members of the College, I look forward with confidence to the prospect of its increasing reputation and extended usefulness. By resigning the Professorship in the University, I take my leave of professional exertions, happy in leaving the Class of Clinical Surgery in a flourishing condition.*

*I have the honour to remain,*

*Mr PRESIDENT and GENTLEMEN,*

*with much respect and regard,*

*your sincere well-wisher,*

*JAMES RUSSELL.*

EDINBURGH, 25th March 1833.

## PREFACE.

---

ABOUT thirty years ago, I composed a few Lectures on the affections of the Testicles,\* and since then I have had many opportunities of studying this important class of affections, under a great variety of modifications. The necessity, too, of preparing myself to explain individual cases at lecture, obliged me to investigate the symptoms of each with attention.

\* The late Dr JOHN GORDON, Lecturer on Physiology, refers to those Lectures, in a paper read before the Royal Medical Society in 1806, which paper is recorded in their books.

The following Essay may be regarded as an extension of the original Lectures, improved by the additional information which I have since acquired from experience and study. I have continued the same stile of composition, as the best adapted to the purpose in view.

The proper object of a Lecture is to present a comprehensive view of a disease. Upon this principle I have conducted the following Essay, carefully avoiding the introduction of individual cases ; or, when any have been introduced, studiously selecting those which were characteristic, and peculiarly instructive. For a single case, well chosen, is often sufficient to establish an important point in the most satisfactory manner ; and I have in general quoted cases from authors of high reputa-

tion, in preference to giving similar ones upon my own authority.

I beg to recommend the late publication of Sir A. COOPER, on the structure and diseases of the testicles, to all who are desirous of consulting a work enriched by a number of important cases, rendered still more interesting by the remarks of an able, intelligent, and experienced Surgeon, besides being illustrated by a splendid series of coloured plates, which render it a standard addition to our national medical authorities.



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\* The section headed *Nervous Affection of the Testicle* (p. 171), was not intended by the Author, who disapproves of nosological division on such subjects, as likely to mislead the judgment, by substituting acquaintance with an artificial system for the real knowledge of a disease.



OBSERVATIONS  
ON  
THE TESTICLES.

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NUMBER OF TESTICLES.

THE structure, functions, and diseases of the testicles, afford very interesting subjects of investigation.

A man is naturally provided with two testicles, which are lodged in the scrotum. In a few individuals, the number of testicles has been found greater or less than

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the usual standard,—more frequently less, and sometimes entirely wanting. The total want of testicles in the scrotum is a circumstance very alarming to parents, from the apprehensions which they naturally entertain respecting the virility of their child. These apprehensions, however, are for the most part groundless, as the absence of testicles from the scrotum arises merely from their having failed to descend from the abdomen before birth ; there being undoubted instances of men without the vestige of testicles in the scrotum having become the fathers of numerous families. And in dissecting the bodies of persons of this peculiar formation of parts, one or two testicles, of a full size, and perfect in all respects, have almost invariably been found in the abdomen, so that a dissection in which the testicles were

entirely wanting, both in the scrotum and in the abdomen, is a very rare occurrence.

A few cases of monorchides of a somewhat equivocal character, are found in the records of medicine. They are modified by different circumstances, which constitute three varieties.

In the first variety, the solitary testicle was divided in the middle by a deep fissure, the lobes on each side were as large as a full grown testicle, and each was provided with a spermatic chord, which ran up to the same side of the body. The fissure, the lobes, and the duplication of parts, obviously result from the partial coalescence of two testicles.

The second variety has undoubtedly the same origin, only the coalescence is more general, and the incorporation more complete. The single testicle was much larger than in an ordinary full-sized testicle, equable in its surface, without any deep fissure dividing it into lobes, and provided with two spermatic chords, running to the different sides of the body. From the simple structure of the testicles, it is easily conceivable how both might be incorporated, without destroying their function as secreting organs.

The third variety agrees with the other two, in having one testicle and two spermatic chords, while it differs from them in the circumstance of both spermatic chords running to the same side of the body. The origin of this variety is not

so obvious, though, like the other two, it is not productive of any inconvenience to the individual.

Any deficiency in the number of testicles may be ascertained by a careful examination of the scrotum. But the determination of the fact is not so easy with regard to the existence of supernumerary testicles; since a conglomeration of the spermatic veins, an enlarged epididymis attached less firmly than usual to the testicles, a portion of indurated omentum, or an adventitious tumour situated in the scrotum, may counterfeit the appearance of a third testicle. These are the ordinary causes of deception; and neither **MORGAGNI**, nor **HALLER**, nor **MECKEL**, ever discovered a third testicle in the dissections of reputed triorchides. Upon this

negative evidence, those three great anatomists doubt the existence of genuine triorchides. But their scepticism does not seem to me to be well founded, since there is nothing in the structure of the testicles, or in their connexion with other organs, to render their multiplicity incompatible with the arrangement of the animal economy; and no person, however well informed, is entitled to discredit the possibility of an unusual appearance, merely because it has not fallen within the sphere of his own observation. **LEAL LEALIS**, an author of high respectability, discovered a third testicle in the body of a man whom he dissected. This discovery sets the question at rest, by establishing the existence of a genuine triorchis; and the certainty of the fact being once established, renders the accuracy of the cases reported

by different authors much more probable. A prominent and well marked case of this kind is reported by Mr BLUMENER,\* of a person with three testicles in the scrotum, two in the left side, one lower, the other higher, nearer to the aperture of the inguinal canal, provided with its full-grown epididymis and spermatic chord, and which could not be mistaken for any preternatural growth, as it had the shape, firmness, and sensation of the other testicle. The sensation communicated by pressing a testicle is peculiar and characteristic.

The annals of medicine contain many cases of reputed triorchides, though it is not possible to lay down any general rules

\* Rust's Magazine, vol. 18. p. 363.

for the diagnosis, since, from the nature of the peculiarity, their true character can be ascertained only by the result of a special investigation. Various authors mention the peculiarity of three testicles as hereditary in certain families.

Although there is no natural limit to the number of testicles, the existence of more than three is an exceedingly rare occurrence. There are, indeed, many cases recorded of persons with four testicles, but the fact has not been verified by dissection. It has been said that persons have appeared with five or even six testicles. In the person who had six testicles, four were of the natural size, and two much smaller. I shall not, however, dwell on a discussion for which the data

are too defective to lead to any positive conclusion.

With regard to the amorous propensities and generative faculties of persons with supernumerary testicles, the report of authors is in general favourable to their being more powerful than in other men. But as those authors often indulge in a playsome humour, their evidence must be taken with a certain degree of reserve. For in the investigation of such a subject, it is hardly philosophical to mention the case of a monk with three testicles, who was so salacious as to have indomitable passions, which prevented him from keeping his vow of chastity ; or that of a landgrave, with a like peculiarity, who was allowed a concubine as a reasonable indul-

gence to a man of his amorous complexion, who could not remain satisfied with the use of a single woman.\*

\* A dog remarkable for his salacity had two testicles in the scrotum, and one in the abdomen.

## DESCENT OF THE TESTICLES.

The testicles, when first visible in the embryo, are lodged in the abdomen, near to the kidneys. They remain in this situation till between the seventh and eighth months of pregnancy, when they descend into the scrotum, so that a child comes into the world with all the external parts of generation complete. But this period of descent is not constant, since sometimes one, sometimes both testicles remain in the abdomen for a considerable time after birth, or even during the whole of life. The detention, however, of only one testicle is by far the most common deviation.

Nothing is known respecting the cause of this retardation. It is wholly unconnected with any imperfection in the confined testicle, since, upon an average of observations, the retained testicle is as fully formed and as large as those which have descended into the scrotum. The individuals do not experience the smallest inconvenience from the peculiarity, so long as the testicles remain fixed in their unusual situation. But whenever they enter into motion, especially in persons at a more advanced period of life, the irritation caused by their progression frequently subjects the patient to much uneasiness, under circumstances which often lead the medical attendant to misconceive and to mismanage the case.

When a testicle is arrested in its pro-

gress through the inguinal canal, it produces a swelling in the groin, which is readily mistaken for an inguinal hernia. Both complaints occupy the same place in the inguinal canal, both proceed from the protrusion of a viscus from the abdomen, and, if the medical attendant be not aware that the patient has no testicle in the same side of the scrotum, he regards the case as an inguinal hernia. Under this mistake, a fruitless attempt is made to reduce the hernia, and, when this attempt fails, a bandage is applied, which, by exciting pain, leads to a more accurate examination of the symptoms, and to the subsequent discovery of the true nature of the case ; for, when an arrested testicle is the cause of the swelling, there is greater sensibility to pressure, and a peculiar sensation which characterizes the feeling of a

testicle. The difficulty of the diagnosis is occasionally increased, by the complication of two complaints, which the late descent of the testicle contributes much to favour. In the first place, when the patient has passed the age of puberty, the large size of the testicle widens the inguinal canal to a preternatural degree. In the second place, the surrounding parts have their disposition to contract which existed in early life greatly impaired, so that, from the concurrence of those two causes, there is an opening left into which some of the abdominal viscera may easily enter, and produce a hernia of the congenital form.

The management of such cases is exceedingly embarrassing, from the difficulty of separating two complaints, which

require to be treated upon opposite principles. For the object of the medical attendant is, on the one hand, to return the protruded viscera into the abdomen, and to retain them there; on the other hand, to promote the descent of the testicles into the scrotum. Those indications are so opposite, that it is often impossible to accomplish both, or even one of them. The separation is impracticable when an adhesion has taken place between the testicles and the protruded viscera, a circumstance which occasionally occurs. In this case, the medical attendant must content himself with adopting palliative practice, by protecting the testicles from accidental injury. The testicle, from its permanent situation, presents an obstacle to the farther descent of the hernia, thereby serving as a substitute for a bandage.

If, however, the testicle should inflame from any accidental cause, the severity of the inflammation is aggravated by the pressure of the surrounding muscles, exhibiting the symptoms of an incipient phlegmon. Those symptoms though deriving their origin from a cause different from what was suspected, naturally lead to the antiphlogistic treatment of rest in a horizontal posture, low diet, local evacuation of blood, and emollient applications. Under this treatment the severity of the symptoms gradually abates, the swelling subsides, and allows the true nature of the case to be ascertained.

There is no room for active practice, since, whether the testicle has formed adhesions to the neighbouring parts or not, it would be imprudent to interfere far-

ther, than, by applying a hollow soft bandage supported by a spring, to afford protection against external injury.

There is not any direct mode of promoting the descent of the testicles. In young subjects, a relaxed position of parts, accompanied with rest in a horizontal posture, fomentations, and friction with oleaginous substances, has been supposed to be of service, as under this treatment the descent of the testicles was completed. The completion of the descent has sometimes followed an attack of fever. The testicle, too, has sometimes emerged suddenly from the lower aperture of the inguinal canal, in consequence of a smart exertion.

After the testicle has reached the scro-

tum, it remains in a passive state, falling by its gravity to the bottom of the vaginal cavity, subject to some change of position, from the contraction and relaxation of the cremaster muscle. A pendulous state of the scrotum is an indication of languor and debility; while the contrary state indicates strength and vigour, and is in some way connected with the act of coition. Certain individuals possess the power of elevating the testicle by a voluntary exertion, and of forcing it back into the inguinal canal. Some artful malingeringers possessed of this power have employed it to deceive the surgeon by making the elevated testicle counterfeit a hernia. A most singular case of this kind is reported by Mr A. C. HUTCHESON, and is so extraordinary and interesting in

all its circumstances, that I shall transcribe it in the author's words.

—“ In July 1806, or 1807, during a cruise off the Island of Madeira, in H. M. S. *Druid*, a merchant-ship from the coast of Africa, bound to Glasgow, was boarded, from which an English seaman and a Negro boy were impressed, and, according to the custom of the service, were, previously to their being finally detained, ordered to the cockpit for the purpose of examination by the surgeon, as to their fitness for the king's service. The man, on stripping himself, said that he was ruptured in both groins ; that he had been “ overhauled ” (examined) a dozen times by the surgeons of different ships of war, and that he had as frequently been

discharged again as unserviceable from this cause.

“ There certainly was a swelling in each groin, very much resembling hernia ; but the weather at this time being extremely hot, and the scrotum therefore very pendent and flaccid, my attention was particularly called to it ; and, on examination, I found the scrotum to be an empty bag, and the testes (of their natural size) lodged in the groin. As soon as this discovery was made, the poor man, from being at length and so unexpectedly detected, became quite unnerved, and so agitated, that, upon re-examining the parts, the testes were found to have descended into their proper places in the scrotum. After commending the man for his ingenuity, and, in place of physic, administering to

him a glass of grog, his spirits were rapidly restored ; and, seeing no longer any chance of eluding the king's service, he displayed before us several remarkable feats of the power he possessed over these organs. He pulled both testes from the bottom of the scrotum up to the external abdominal rings, with considerable force, and again dropped them into their proper places, with incredible facility. He then pulled up one testis, and after some pause the other followed, as the word of command was given ; he then let them both drop into the scrotum simultaneously. He also pulled one gradually up, whilst the other was as gently-descending ; and he repeated this latter experiment as rapidly as the eye could well follow the elevation and descent of the organs, so that my assistant and myself were not only

surprised, but so exceedingly amused, that we could hardly believe the evidence of our senses. This man afterwards proved to be a willing and hard-working man.

“ Except in the above remarkable case, I know of no instance on record of the cremaster muscles being muscles of will ; and as it was so singular a case, I shewed the man to several of the medical officers of the squadron we happened to meet with during the remainder of my service in that ship.”

Several other anomalous cases are recorded. In one, the scrotum was corrugated, and the testicle elevated upon the blowing of the east wind, which, in general, is a cause of languor and relaxation. In another the testicle ascended

into the inguinal canal, whenever the party was in company with women.

But the most curious deviation from the ordinary course of descent, is when the testicle, instead of descending through the inguinal canal, which is its natural course, accompanies the femoral vessels in their progress under POUPART's ligament, making its appearance at the bend of the thigh. Mr ARNAUD gives several instances of this singular variety. The most instructive case is detailed at considerable length. An officer, about forty years of age, consulted Mr ARNAUD respecting a swelling in the bend of the thigh, which was taken for a hernia. Upon an accurate examination of the case, however, Mr ARNAUD satisfied himself that the swelling was not a hernia, but a

misplaced testicle. He adduces three reasons in support of his opinion. *1st*, That the officer had not a testicle in the same side of the scrotum. *2d*, That the swelling had the form and consistence of a testicle, the appearance of the spermatic chord alone being sufficient to distinguish the case from a case of crural hernia. *3d*, That pressure produced exactly the same sensation on this as on the other testicle. Mr ARNAUD gave a most judicious advice, that the patient should, now that the testicle had passed out of the abdomen, treat it as he did the other testicle, by doing nothing.

The arrival of the testicles in the scrotum does not produce any change in the constitution. They are of a small size, and are not endowed with much

sensibility during infancy; when full grown, they are rarely equal in size,—a circumstance which ought to be known by all practical surgeons; otherwise their ignorance may lead to very distressing consequences. **FABRICIUS AQUAPENDENTE** gives a most instructive instance of this in the case of a young man, who, upon observing his testicles to be unequal in size, became alarmed, and consulted a rupture-doctor about his supposed disease. The quack pronounced the case to be very alarming, and advised the immediate extirpation of the testicle. The patient, however, being unwilling to submit to so severe an operation without farther advice, consulted **AQUAPENDENTE**, who relieved his fear, by satisfying him that the supposed disease was nothing more than a natural in-

equality in the size of the testicles, a difference which almost constantly takes place.

The testicles likewise are in general suspended at unequal distances from the pubis.

The right testicle is said to be more frequently affected with scirrhus, and the left with varicocele. But the truth of this remark requires confirmation.

Although the testicles perform a very important office in the animal economy, they do not come into action till many years after birth, and they cease to act before the natural period of death. So that the existence and well-being of an individual at the commencement and at

the decline of life does not depend upon the functions of the testicles. During the stage of manhood, the intermediate interval, the functions of the testicles possess a very powerful influence in modifying the condition of the individual. When the testicles begin to act as organs of generation, the prominent features in the character of a young man, both with regard to his body and to his mind, undergo a very marked change. This critical period is termed Puberty. Then a degree of energy, which before lay dormant, is displayed in all his sentiments and actions. He becomes ardent and impetuous, and capable of much greater mental exertions, so that his mind seems to be expanded and invigorated. His bodily frame undergoes corresponding changes. His voice becomes deep and

hoarse, his eyes more animated, his chin and pubis covered with hair, his muscles acquire a torosity and strength which they did not possess before, and all his motions are vigorous and alert. These characteristic changes take place in the course of a few months, accompanied with an enlargement of the testicles. With regard to their rate of progress at the commencement and the termination of their powers, they follow a very different ratio. They advance rapidly, attaining their state of perfection in the course of a few months; while they decay gradually, their powers declining for many years before they are completely annihilated.

The age at which puberty takes place is influenced by a great many circumstances. Much depends upon the consti-

tution of the individual in any particular instance. But, independently of any special peculiarity of constitution, there are certain general circumstances which accelerate or retard this great constitutional change. The chief of these is climate. In this country the age of puberty may be stated from fourteen to sixteen years of age. The inhabitants of warm climates attain the age of puberty much earlier in life than those of cold climates. In the *Torrid Zone* it is some years earlier, and has a more powerful influence upon the constitution. In the *Frigid Zone* it is many years later, and has a feeble influence upon the constitution.

The circumstances in which an individual is placed, according as he enjoys abundance of wholesome food, leads a life

of ease, with exercise in the open air, unaccompanied with fatigue, has comfortable lodging and warm clothing,—have a most powerful influence in modifying the state and functions of the testicles. But besides these circumstances, which likewise affect the other organs of the body, the testicles are in a peculiar manner under the influence of the imagination. The imagination and the state of the testicles mutually affect one another,—a relation which deserves much attention in considering the natural history and diseases of the testicles. This mutual influence of the imagination and of the testicles upon each other is modified by the order of precedence in which those two powerful agents come into action. When a change in the state of the testicles is prior to any movement in the imagination, the imagination

is not solicited to act, till the corporeal organs have acquired strength, and even then the impression is made gradually. But in the converse progress, when the imagination comes first into play, the organs of generation are stimulated to action before their strength is confirmed, and by this premature exertion the powers of the body are to a certain degree exhausted. The circumstances attending the rearing and education of young people illustrate this doctrine in a very striking manner. When a boy is reared in the country upon simple nutritious food, without the stimuli of condiments or fermented liquors, he enjoys luxuriant health, acquires great bodily strength, and does not feel the impulse of venereal appetites till nature admits of their gratification without any risk of injury. While, on the con-

trary, a boy, in a populous, luxurious, dissipated city, is reared under circumstances much less favourable to the acquisition of strength and to the permanent enjoyment of health. But what more especially relates to the present purpose, his imagination is often addressed in various ways, which make a powerful impression on his venereal appetites, and call them sooner into activity than is salutary to his constitution. Loose conversation, obscure allusions to mysterious connexions with females, dalliance with females of wanton habits, the perusal of obscene books, together with the exhibition on the stage of scenes of a lascivious tendency, or the representation of amorous subjects in paintings, all contribute to excite prurient ideas in the mind of a young man. In this way his imagination

rouses his venereal appetites, and calls them sooner, and more forcibly, into action, than if they were left solely to the impulses of simple unsophisticated nature. The premature and excessive gratification of his venereal appetites produces a very marked effect, both on his habits and on his constitution. His ideas and attention run too much on the gratification of his amorous passions. And as at this early period of life his bodily powers are easily excited, he is enabled to indulge his propensities to a much greater extent than is consistent with the good either of his body or of his mind. He acquires a morbid degree of irritability both in his bodily organs and in his mental faculties. Perseverance in such a course of life not only prevents the natural acquisition of health and strength, but even impairs

what he had already acquired, and, by gradually exhausting the powers of his constitution, induces a premature state of impotence. For the testicles seem destined to perform their natural functions only to a certain extent, and for a limited time. In those despotic countries in the warm climates of the East, where the unhappy females are slaves to the lust and passions of tyrannical rulers, who begin their sexual intercourse at an unseasonably early period of life, the men lose the power of procreation, and become impotent not many years after the time when the body is supposed to have attained its highest degree of vigour and perfection. M. VOLNEY, in his Travels through Asia Minor, mentions that the people of rank in that country, who can afford the expense of keeping seraglios, are, in ge-

neral, impotent at the early age of thirty. Matters are not so bad in this country. Though it is a well known fact, that young men of fashion, who indulge their amorous propensities to excess at an early age, lose the power of procreating sooner than the more continent, and are familiarly distinguished by the quaint appellation of God's Geldings. I never have been able to discover any exterior marks of discrimination, to distinguish these from other men; but the ladies, who are more discerning in such matters, predicted, in a district of country with which I am acquainted, of six gentlemen in the prime of life, that they never would beget children. The event verified the prediction, as all the six were married, and every marriage proved barren. The defect rarely goes farther in this

country than to prevent individuals from procreating heirs to their estates. I have known very few instances of more calamitous consequences. In one distressing case, of a young gentleman of rank and fortune, the effect of premature and excessive indulgencies weakened him so much, that he lost all enjoyment of life, sunk under a degree of despondency which did not admit of consolation, and, though I encouraged him to marry, in full confidence of his recovering his health by prudent management of his constitution, he would not listen to my exhortations, and drowned himself in a fit of despair.

—From the general tenor of the above statements, and particularly from the melancholy catastrophe of the last case, every one concerned in the education of youth must perceive the importance of prevent-

ing the minds of young men from being corrupted by impure addresses to their imaginations during the early years of their lives.

The safe indulgence in venereal propensities belongs to the age of manhood. In early youth, or in old age, it is injurious. But in those two extreme stages of life the effects are different. In youth, the influence of the imagination, increased by habit, can raise up temporary powers of gratification almost to an unlimited extent, and thereby, in the course of a few years, irrecoverably exhaust the strength of the individual. But though this imprudence may render him permanently miserable, it does not deprive of life. But in advanced years it is otherwise, as an old lecher may inflame his imagination to an

extravagant degree, without being able to command powers equal to the gratification of his desires. Or if, by artificial excitement, he should occasionally attain his object, the indulgence exhausts his strength in an alarming degree. An early death is the frequent consequence of old men marrying young women.

Castration has a very powerful effect in modifying the person and character of the mutilated individual. When a boy is castrated in early life, he does not display any masculine features in his subsequent growth. But this imperfect evolution of the system does not arise from any want of a tendency to increase in size, as eunuchs are inclined to be large and corpulent. At the same time, they are unshapely in their form, lax in their fibre,

and deficient in muscular strength, their muscles never attaining the torosity and firmness of those of an entire man. But the most marked distinction in their external character is the total want of a beard, and the acquisition of a sweet, clear, flexible and melodious voice. There is not the smallest tendency to a change in the constitution at the critical period of life corresponding to puberty in a perfect male. With regard to the duration of their lives I have not obtained any accurate information. The state of their minds seems as much inferior to that of perfect men, as the state of their bodies. They are decidedly deficient in vigour and energy, and do not possess in an equal degree a clear, comprehensive and sound judgment. NARSES, the celebrated general of the Roman emperor JUSTI-

NIAN, is the only eunuch in the political history of the ancient world who shines as a man of talents and abilities. And there is not a single instance on record of an eunuch having been distinguished in science or in literature.

There is no doubt with regard to the efficacy of castration performed in early life in preventing the attainment of a masculine form and character. But if the operation be delayed till the individual has attained his full growth, and his full powers in mind and body, will the removal of his testicles alter his constitution, by making him follow what may be termed a retrograde progress? It is a practice to castrate unruly horses, to make them tractable. Castration has probably a similar effect on man. Maniacs have been

deprived of their testicles, with a view to subdue their fury and paroxysms of violence. I cannot speak of the practice from my own experience, nor has the subject, so far as I know, been sufficiently investigated to admit of generalization.

As the removal of the testicles brings the male to approach more nearly to the character of the female, so the removal of the ovaria in the female produces a corresponding deviation from the peculiarities of sex. Mr POTT relates the case of a woman, who, having had both ovaria extirpated, lost all venereal appetite, and her muscles became more masculine.

From the striking similarity in the effects produced in both sexes by removing the organs of generation, one would be in-

clined to suspect that there is a common mould for the species, which is formed into a perfect animal, by superadding the organs of generation belonging to the intended sex; and that, by the removal of these organs, the perfect and more complex animal has a tendency to revert to this simple mould. In confirmation of this idea, it may be observed, that certain animals, when they lose the power of breeding, likewise lose the external characters of their sex, and assume that of the common mould. Thus hen-pheasants, past breeding, have, upon moulting, been adorned with the feathers of the cock. A specimen of a similar metamorphosis in the case of a peahen, is preserved in the Natural History Museum of the University of Edinburgh.

To the same class of phenomena probably belongs the growth of hairs on the upper-lips and chins of elderly women, indicating the approach of a beard.

The functions of the testicles are regulated upon very different principles from those of other important organs. The heart, brain, and lungs must be kept in perpetual action, to preserve the animal alive. But the functions of the testicles may be suspended for an indefinite time, without producing any perceptible disturbance in the constitution. The reason of this difference is obvious, since, though the occasional action of the testicles be indispensable for the propagation of the species, their uninterrupted action is not necessary for the preservation of the individual. But as the testicles make

a part of the general system, their functions, as organs of secretion, are, to a certain degree, in constant action, by which means a quantity of semen is secreted. Now, what becomes of this semen? Is it evacuated after the accumulation of a certain quantity? or is it absorbed into the system? or is the energy of the gland depressed and laid dormant for a time? I do not know any direct proof of semen, in the case of a man, being absorbed into the system. With regard to certain quadrupeds, indeed, it has been observed, that during the rutting season they have a rank smell, which has been explained by supposing the semen to have been absorbed, and to have been diffused through the atmosphere by the medium of the insensible perspiration.

The other two conditions take place in the human species. In some cases the testicles lie dormant, or even waste, from want of use; in others, they swell from being distended with semen. It is well known that men may, without suffering inconvenience, live for many months without connexion with women. In this passive state, the action of the testicles seems to be suspended. They are even said to waste away altogether, in consequence of long-continued continence. DODONEUS mentions the case of a monk (referred to by many authors), whose testicles were completely wasted from this cause. JAQUES and RENAUME have written a particular essay on the chastity of monks, which I regret never having had an opportunity to consult.

The converse of this progress, however, is the more frequent, the testicles swelling and becoming painful from an accumulation of semen, which distends the seminal vessels. If this distension be not relieved by a natural evacuation, it produces a degree of irritation, which gradually increases in severity, till it becomes quite intolerable. Instances are on record of the severity of this irritation becoming so great as to require the extirpation of the testicle, which being laid open, a quantity of semen burst forth, whose confinement seemed to have been the sole cause of the mischief. This termination, however, is by no means the most frequent, since, in general, nature procures relief by a spontaneous emission of semen during sleep, accompanied with lascivious

dreams. Thus a salutary provision is in so far made to obviate any inconvenience which, otherwise, an accumulation of semen would produce; and, if the quantity discharged be no more than sufficient to remove the superfluity, the patient will rather be relieved than injured by the evacuation. But if the emissions occur too frequently, or to too great an extent, they undermine the health and strength of the patient, producing a most distressing and exhausting disease. In this induced state of bodily weakness, a very slight irritation is, without the natural precursor of previous erection, sufficient to produce a seminal emission, indicating a high degree of morbid irritability.

In considering these two extreme cases of involuntary emissions, it is obvious that

both of them have a certain relation to sexual intercourse, and, therefore, that a well-regulated intercourse with females will be serviceable in both cases. The manner in which this intercourse operates in cases arising from a plenitude of health, producing an unusual degree of vigour, is easily understood. And if cohabitation with a female does not alone prove sufficient to accomplish the end in view, other auxiliary means of reducing the patient's strength may then be employed. The object is perfectly within the command of practitioners. It is, however, a form of complaint which does not often occur, and seldom continues so long as to require professional advice.

The manner in which sexual intercourse procures relief, in cases of morbid irritabi-

lity not being so obvious, requires a fuller explanation.

Seminal emissions, in persons enjoying health, are preceded by a full erection of the penis, although no emission takes place till the subsequent stimulus of coition excites the requisite actions in the other organs of generation. But in persons afflicted with morbid irritability, the case is widely different, since in them emissions take place without a full erection of the penis, and without the additional stimulus of coition. The general diminution of power in the generative system, the inseparable concomitant of morbid irritability, occasions both a failure on the full erection of the penis, and a want of retention in the secreting or-

gans, thereby deranging the performance of their functions. The indication of cure in such cases is to restore the proper balance in the order of succession of the different subordinate actions, and to invigorate the whole generative system. To fulfil these indications, it may be observed, that there is a tendency in nature to restore the equilibrium in the relative action of parts which has been disturbed by the interference of disease, and that, if advantage be taken of the tendency, the restoration may in time be accomplished. Now, there is a very powerful impulse of this kind in what relates to the generative faculties and sexual intercourse. And although at first the erections are feeble and transient, and the emissions premature, yet, if the person

avails himself of the erections, such as they are, to copulate with a female, he will find them become gradually more vigorous and permanent, and the emission retained till the act of copulation is farther advanced. Thus, by judicious management of sexual intercourse, the generative organs regain their natural and healthy mode of action,—although they do not attain their primitive unimpaired vigour till after a continued course of uninterrupted steadiness in this practice.

It may farther be observed, that, after the organs of generation have regained their healthy mode of action, vestiges of the original infirmity still remain in a preternatural propensity to sensual grati-

fication, whether it be excited by external objects of desire or by mental and corporal sensations. The too ready indulgence, however, in such propensities produces the very worst effect, by encouraging a habit of gratification, which has a powerful tendency to induce a return of the original infirmity. In the progress of convalescence, therefore, the patient should resist these morbid solicitations to venery, and, by steadily adhering to a prudent degree of continence, secure the completeness of his recovery. A matrimonial connexion is favourable to the convalescence of such patients, who may conscientiously enter into the married state in confidence of marriage ultimately proving a cure.

Although both varieties of nocturnal

emissions agree with a regulated use of women, the treatment of them, in other respects, requires to be essentially different.

The first case, which depends upon an exuberance of health, admits of depletion and a cooling regimen. With this treatment any troublesome excess may for certain be subdued. It is a much less serious evil than the other variety, and much less frequent.

The second variety, as it depends upon weakness and irritability, is much less tractable, and often baffles the most judicious treatment for a great length of time. The indications of cure, so far as diet is concerned, is the direct contrary of the

other variety, since abundance of nutritious food, to communicate strength and invigorate the system, is an indispensable requisite of the medicinal treatment. Stimulants of all kinds must be carefully avoided, or used in great moderation under special circumstances when great languor and lassitude prevail. The patient should also be abstemious in liquids. He should not indulge in habits of a relaxing nature. Instead, therefore, of sleeping on a soft feather-bed, he should lie on a firm matrass, with the air of the room at a moderate temperature, and he should not allot many hours to sleep. He should pass much of his time in the open air in a cool atmosphere, take frequent and moderate exercise, neither used so long, nor pushed so far, as to occa-

sion fatigue. Cold bathing, too, is a useful auxiliary. Even local cold bathing, frequently repeated, is of advantage ; for which purpose, a vessel of cold water may be placed at the bedside, and a wet cloth applied occasionally to the testicles. Great attention should be paid to preserve the general health unimpaired ; and, with regard to particular medicines, there are none more serviceable than the different preparations of iron.

Besides the above practices, which relate to the state of the body, it is of great consequence to attend also to the state of the mind. With this view, the patient should banish from his thoughts every lascivious idea, and abstain from reading any book addressed to the imagination on matters of love. And as patients affected

with these complaints are apt to despond, and to be troubled with low spirits, every recreation should be encouraged, to prevent them from thinking of their own situation, and, if possible, to keep them amused, or at least to keep their minds occupied with objects which engross the whole of their attention ; the patient, at the same time courting the society of lively and agreeable company. By uninterrupted perseverance in this mode of treatment for a sufficient length of time, the patient may reasonably entertain hopes of obtaining a radical cure.

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*Note.*—I have abstained from the mention of self-pollution or onanism, which

is obviously a case of extreme irritability and weakness, induced by improper practices, which medical writers have universally reprobated in a stile of declamation little suited to a didactic work.

## DISEASES OF THE SCROTUM.

THE scrotum, besides local circumscribed affections, is liable to suffer from general affections of the whole surface of the body, such as cutaneous diseases, anasarca, and general emphysema. In anasarca, the swelling of the scrotum often proves very annoying to the patient, from the large size which it attains, in consequence of the laxity of the cellular tissue, and great distensibility of the skin. The only treatment which promises to procure relief to the scrotum is puncturing. The expediency of this treatment is, however, doubtful, from the tendency of all

wounds of the scrotum, in cases of anasarca, to mortify. The risk of this unfortunate event often more than compensates the prospect of any expected advantage. The choice of practice, therefore, must be determined by a due consideration of all the circumstances of the case, the patient's constitution, the state of his health at the time, and the particular character of the disease. In cases of emphysema the practice is quite safe and highly advantageous.

There are a few instances on record of local œdematosus swellings of the scrotum independent of general anasarca. Such cases, however, are of rare occurrence : they are not accompanied with constitutional symptoms, are not dangerous, and are easily cured.

All cases of general prurigo, or intolerable itching of the skin, include the scrotum. But writers on cutaneous diseases also describe prurigo-scroti as a specific complaint, depending upon a morbid state of the skin, or superficial glands of the parts. The scrotum, in this case, often assumes a brown colour, becoming thick, scaly, and wrinkled. It is a most distressing complaint, the itching giving little respite either by day or by night, often not yielding to the use of the most efficacious remedies, nor even admitting of palliation. Those advanced in life are the most frequent subjects of attack. A lotion prepared with corrosive sublimate, or with red precipitate dissolved in lime-water, has for the most part a good effect. If excoriations have been produced by scratching or otherwise, it is proper pre-

viously to apply some mild ointment till the cuticle be renewed. The obstinate and intractable nature of the complaint, however, often baffles the skill of the practitioner. This prurigo is sometimes attended with excoriation and discharge of fetid matter, which renders the case more troublesome and offensive. I have known a case successively under the care of several of the first practitioners in Edinburgh, without any of them being able to devise any remedy which was of essential benefit to the patient. Warm bathing, especially in sulphur-baths, often affords some temporary relief. It is, too, of great consequence to keep the functions of the skin and digestive organs in a healthy condition, by observing great temperance in diet, abstaining from every

thing stimulating, and keeping the bowels freely open.

The scrotum has been found covered with a number of warts. This, however, is a singular complaint.

A very curious case is mentioned by RUST in his Magazine \*, upon the authority of Dr BEAMTEN, of a patient that, with other troublesome complaints, was once or twice a-day attacked with a swelling of the scrotum, which at length acquired a deep red colour, and a stony hardness, when blood, as from a fountain, sprung from a hundred sources, in the finest streams, till the scrotum was again emptied. CONRADI mentions a blue

\* Vol. xviii. p. 95-6.

sweat exuding from the left side of the scrotum \*.

Dr MOTT of New York describes a very curious and singular tumour of the scrotum, so large as to reach down two-thirds the length of the thighs, studded with several dozen tumours, from the size of nutmegs to that of large peas, of stony hardness, and covered with integuments. It resembled an enormous bunch of grapes. All the tumours had a very white appearance, and the integuments of one or two of the largest having been ulcerated for more than a year, poured forth a constant and very fetid discharge. At the openings white bodies were seen, which, when touched with a probe, felt of a stony hard-

\* PLOUQUET, vol. x. p. 665.

ness. A white substance, resembling mortar, was discharged from these openings. This complaint was upwards of twenty years' duration, and had been gradually increasing, the tumours multiplying as the scrotum augmented in size. The patient was desirous of having the diseased parts removed. As his health was good, and the testicles moved freely in the diseased mass, Dr MOTT recommended the operation, and performed it by removing the whole of the scrotum, on both sides, down to the tunica vaginalis. The recovery was complete, with the reproduction of the scrotum. Three years after the operation the patient enjoyed excellent health.

The scrotum is more predisposed to mortify than most parts of the body. It

occasionally mortifies at the termination of tedious exhausting fevers, and on attacks of erysipelas. Such cases are always severe, though not fatal, excepting under circumstances particularly unfavourable. The whole of the scrotum is sometimes completely destroyed, and afterwards completely regenerated, even to the production of the hair\*. This, however, very rarely occurs. Even the perfect regeneration of the skin is by no means a constant termination. In those cases which I have seen, the naked surface of the testicle, or of the tunica vaginalis, was, after the cure, covered only with a thin pellicle, which adhered to the subjacent parts, and did not possess any mobility. This pel-

\* Hildanus, lib. v. case 66. *Journal de Médecine*, vol. lxxxiii. Juin 1830, p. 406-16.

licle or cicatrix is often so limited in extent, as to confine the testicles to one situation, and sometimes even to subject them to an inconvenient degree of pressure. In one case, the constriction was so great as to create the most excruciating pain, which rendered the life of the patient miserable, and induced him to submit to the removal of a testicle. But as this partial operation did not procure complete relief, he soon after requested to have the other testicle also removed. This was an extreme case. But when the tendency to constriction once begins, there is no method known of arresting its progress nor of palliating its effects \*.

The counter part of constriction occurs

\* ACREL, vol. i. p. 474.

in the elongation of the skin of the scrotum. The disease is termed rachosis. Most surgeons recommend the partial abscission of the scrotum as a safe operation, while others represent this elongation as rather an inconvenience than a disease, and not of sufficient importance to subject the patient to any severe treatment. Mr ACREL was called to visit a patient on the third day after an operation, in which one-third of the scrotum had been removed at the urgent request of the patient. The patient's extremities were then cold, the testicles and scrotum black, and he died eight hours after the time of Mr ACREL's visit. The unfortunate termination of the above case could not be anticipated. I never met with an instance of this extension of the skin of the scrotum, but I have known the

same disease occur in other parts of the body, and the exuberant portion removed without inconvenience, but not with the effect of preventing the contiguous portions of skin from assuming a similar morbid action.

The most singular disease of the scrotum is the growth of a tumour of enormous size. In a memorable case of the kind, Ger. Ephr. 1692, the tumour attained the weight of more than 200 lb., a weight considerably greater than the weight of a well grown man of ordinary stature. These tumours, in general, begin insensibly without pain, and are not perceived till they attract notice by an obvious swelling. In a few cases they are the consequences of a blow, or their commencement is marked by a slight attack

of pain, which is temporary, and does not return during the course of the complaint. Their progress is gradual and regular, and they may often be traced back for fifteen or twenty years. They do not occasion any inconvenience, excepting what arises from their bulk and weight. They are not only free from pain, but endued with very low powers of sensibility, since neither the application of caustic, nor the introduction of setons, excite any troublesome degree of irritation. A friend of mine, who practised some time in the West Indies, informed me that the rats sometimes fed upon these enormous tumours, while the patient lay in a most helpless condition, and was unable to defend himself from their attacks. The tumours bore being handled with considerable roughness, without the patient suf-

fering from this rude treatment, excepting when the pressure was made on the part of the surface corresponding to the situation of the testicle; then, indeed, the patient complained of pain, as the testicle still retained its natural sensibility, or even possessed it in an unusual degree\*. The growth of such immense swellings does not affect the constitution, nor produce any symptom of debility. It does not, in all cases, even impair the function of generation, as DELPECH particularly mentions that neither the penis nor testicles had lost any thing of their natural faculties. In this respect, however, the symptoms are not uniform, since, in some cases, the functions of the testicles seem to be suspended or impaired. In the case men-

\* DELFECH.

tioned by Mr CORSE SCOTT, the patient had not had any connection with a female for ten years before the time Mr SCOTT saw him. In the case described by Dr TITLEY, the patient had lascivious desires and erections, but no emissions. While Dr WELLS states that the patient's health remained unimpaired, while his virile powers gradually diminished, as the scrotal tumour increased.

It is necessary to investigate these particulars with great care, since the expediency of saving or of removing the testicle, often depends upon the result of this investigation.

This very singular disease of the scrotum belongs to the warmer climates of the globe, the East and West Indies, and the

correspondent latitudes of Africa. It is endemic, and very prevalent among the Bambara nation, on the coast of Guinea, among whom the misfortune of having a monstrous testicle is regarded as a mark of nobility. When the patient goes out to ride, the testicle is supported on a bowl placed on the pummel of the saddle; and when of the largest size, supported on a sheet passed over the shoulders, and dragged along the ground, when he attempts to walk.

I know of only two well authenticated cases of this disease having originated in Europe. One occurred in the practice of **Mr LISTON**, Surgeon to the Royal Infirmary, Edinburgh; and the other in that of **Mr DELPECH** of Montpelier. There is a third case by **Mr HALL** of Manches-

ter, probably of the same kind, though, as the symptoms are not decidedly marked, I have not included it in the number of well authenticated cases.

In the West Indies, the disease was long confined to the Island of Barbadoes. But of late years it has spread extensively over many of the other islands, from causes wholly unknown, and is now a disease of very frequent occurrence.

It is one of those diseases which has not any natural termination, but continues to increase progressively, without any limit to the size which it is capable of attaining. The tumours have no tendency to suppurate, nor to undergo any change in their constitution from increase of size. The constitution of all the tumours which

have been examined by dissection, is nearly alike. The lamellæ of the cellular tissue are distended in every direction. This increases the intervening spaces, which form the areolæ, whose contents are colourless; a part is fluid, and flows out when the section is made; the other part is of a more solid consistence, and retains its form and situation, although the areolæ be open. The whole contents are converted into a solid mass, by the application of heat or of alcohol. The skin often attains the thickness of three inches, acquiring a consistence approaching to the nature of cartilage. In some cases the conversion into cartilage has been complete, and even a portion of the tumour converted into bone. These slight diversities, however, do not affect the general character of the tumour,

which is as homogeneous in its structure as large tumours commonly are. The testicles do not participate in this disease of the scrotum, being lodged in their natural cavities in a healthy condition. Sometimes one is somewhat larger than natural, while the other is somewhat less, and surrounded with a collection of water. But in neither case is there any indication of disease, while their envelopes are involved in the diseased mass. The arteries are not increased in number or in size, so that there does not appear to be any provision for the nourishment of these immense masses. In most cases of accidental tumours, the arteries are greatly enlarged, and pulsate with preternatural activity. This, however, is not the case in steatomatous tumours, which attain a very large size, with hardly any connec-

tion with the surrounding parts, and without any enlargement of the arteries, which, in some cases, are scarcely visible. The veins on the surface of steatomatous tumours are often varicose, and, though this is not a general symptom in large tumours of the scrotum, it sometimes takes place to a very remarkable degree. In one case mentioned by Dr WELLS \*, the veins were so much enlarged as to equal the size of the vena cava, and resembled the convolutions of the intestines.

The spermatic chord is necessarily elongated, in consequence of the testicle being dragged down by the growth of the tumour; which frequently is a foot below its natural position. In other respects

\* TITLEY, 321.

however, the chord seldom undergoes any alteration. Sometimes, indeed, though rarely, the bloodvessels are somewhat enlarged.

The surface of these tumours is in general rough, and somewhat tuberculated ; and when of long standing, they become covered with a brown scaly crust. The nature of this disease, so far as it is known, bears considerable analogy to a species of Elephantiasis, distinguished by the name of the Barbadoes or Cochin leg. M. LARREY, who saw many cases of it in Egypt, where it is endemic and very prevalent, says, that, in most instances, this affection of the scrotum is conjoined with Elephantiasis of the lower extremities. The nature of the swelling is similar. The conjunction, however, is

not constant, as many insulated cases of such tumours occur, when the patient does not suffer from Elephantiasis in any other part of the body. I do not, however, adduce this fact as conclusive evidence against the two symptoms arising from the same morbid state of the constitution. In scrofulous cases, we often meet with single symptoms, most graphically characteristic of scrofula, while all the rest of the body is sound. The case may be the same with regard to the relation subsisting between the large tumours of the scrotum and the Elephantiasis of the extremities.

With regard to the treatment of this disease, little satisfactory information can be given. A great variety of remedies have been tried without producing any salutary

effect. Among others, caustics and setons have been employed, but although they produced a copious discharge of serous fluid, they did not procure any permanent diminution of the tumour. M. DELPECH is sanguine in his expectation of deriving essential benefit from the use of pressure, upon the supposition that the tumour is occasioned by a lymphatic effusion. I have known pressure useful in slight incipient cases of effusion in the lower extremities ; but the practice is not applicable to tumours of the scrotum, from the impracticability of applying pressure of sufficient intensity to be of use, without irritating the testicles to a degree which would be insupportable to the patient. Upon the whole, the disease is admitted to be incurable, and no resource

left but the extirpation of all the diseased parts.

It seems sufficiently obvious, that neither the situation of the parts, nor their anatomical structure, nor their use in the system, nor the change produced in them by disease, present any reasonable objection to their removal. Their situation is external to the cavities containing the organs essential to life ; they have not any connection with them which should make their separation dangerous ; the suspension of their functions does not impede or derange the actions of any other set of functions in the system ; and their anatomical relations do not necessarily expose the patient to risk in performing the operation, nor, so far as relates to practice,

are any of these circumstances altered by the changes induced by disease. This was the opinion of M. LARREY, who, having seen many instances of the disease, had considered the subject maturely, but was prevented from carrying his views into practice from being obliged suddenly to leave the place of the patient's residence. The cases on which M. LARREY intended to operate were of a very large size. Dr TITLEY is the first who carried the practice into execution. The operation was performed without difficulty, was not attended with much hæmorrhage, and the cure was speedy and complete. The tumour weighed 70 lb. Avoirdupois, and included the testicles; Dr TITLEY conceiving that, as there was not any seminal emission, the testicles were useless organs. The

expediency of removing or of preserving the testicles is, however, a point of very delicate determination. Their removal tends much to facilitate the operation ; while an attempt to preserve them subjects the patient to a very tedious and severe operation. Yet the removal of them would be unjustifiable, when the patient had frequent emissions, like a person in vigorous health, as was the case in the instance recorded by M. DELPECH. Before, then, determining the character of the operation to be performed, it is requisite to ascertain the probable state of the testicles. M. DELPECH had the good fortune to preserve the patient's testicles after a very tedious and difficult operation of nearly an hour's duration, which had almost totally exhausted the patient's strength, and had brought his life into

imminent danger, as his extremities continued cold, his face pale, and his pulse imperceptible, for an hour after the operation was finished.

To perform an operation liable to such contingencies is a very critical point of practice. Mr LISTON began his operation in hopes of being able to preserve the testicles ; but, upon making the first incision, the blood gushed out with an impetuosity which obliged him to proceed with all possible dispatch to finish the operation, which he did in not very many seconds. Yet, notwithstanding this celerity in operating, the patient's strength was so completely exhausted by the profuseness of the hæmorrhage, that he fainted, and did not revive till, by repeated doses, he had, at short intervals, taken a pint of

strong whisky. There are thus two sources of danger in the operation. One proceeding from an insupportable loss of blood : the other from the exhaustion inseparable from a protracted operation. Thus, in the operation of Mr WILKES, the patient died on the table, after he had been under the hands of the surgeons for nearly eight hours. No constitution could bear so long suffering ; so that, if there be a prospect of so very tedious an operation as will necessarily endanger the patient's life, it is more just not to attempt the preservation of the testicles. This may be expected if the penis and testicles be completely involved in the diseased mass, especially if this mass be very much indurated, and adhere firmly to all the included parts. Or, supposing the operation to succeed under so many unfavourable circumstances,

there is a risk of the penis being so much tied down and confined as not to be fit for the office of copulation. In M. DELPECH'S case, which was successful beyond expectation, this inconvenience had occurred to a certain degree; so that the prospect of unavoidable imperfection is an element to be taken into consideration in forming our judgment of the practice.

The data upon which any presumption is formed with regard to the state of the testicles, are suspension of all connection with females for many years, as happened in the case recorded by Mr CORSE SCOTT; want of seminal emissions, as in the case by Dr TITLEY; decline of the virile powers, in proportion as the scrotum increased in bulk, as that by Mr WELLS.

The data upon which the risk of hæmorrhage is to be estimated is more obscure, when there is not any visible change in the increased number or size of the bloodvessels. In Mr LISTON's case, there was not any premonitory indication of a formidable hæmorrhage likely to occur upon the first incision. In Dr WELLS' case, the arteries were few and small, so that it was necessary to apply a ligature only to one of them. Notwithstanding the smallness of the arteries, the veins, though rarely, are sometimes enlarged and varicose to a very great extent, and when wounded discharge a large quantity of blood at once. I have known similar accidents occur after the excision of steatomatous tumours in which there had not been any arterial hæmorrhage, but

some hours after the operation, when no mischief was apprehended, an alarming gush of blood took place from the subcutaneous varicose veins.

In taking a general survey of all the cases of enormous tumours of the scrotum which have been operated on, there is great encouragement to undertake the operation. The operations have in general been successful. And in the few cases which have been unfortunate, the failure could easily be accounted for from the special circumstances of the case. There are in all thirteen or fourteen cases of operation on record\*. There is a vague reference to an unsuccessful case by Mr RAYMONDON, without any particulars.

\* TITLEY, p. 307.

I therefore set this case aside, as one from which, from want of sufficient information on the subject, we are not entitled to make any positive inference. I have already animadverted on the operation by Mr WILKES, protracted to nearly eight hours, which I hardly regard as a fair instance of the danger, as I would not have expected that any prudent surgeon would suffer an operation to occupy so great a length of time. In another fatal case, the patient was under a great state of alarm, as was evident from his countenance and manner; so that, although the operation was performed with great dexterity and despatch, the patient died on the table. In this case, the patient's death may fairly be ascribed to the effect of fear. In the case of a Chinese, the operation was begun in hopes of saving the testicles

and penis, but in the course of operating, the patient's strength sunk so much, that it was found necessary to remove the testicles and penis for the sake of despatch. The patient fainted once or twice, but rallied after a short time. His pulse, though weak, during the operation, could, after the operation, be felt at the wrist. But in a few minutes, another fit of syncope came on, from which he never rallied. The operation lasted for an hour and three-quarters.

I do not regard the number of fatal cases as forming a serious objection to the removal of an enormous tumour from the scrotum. Dr TITLEY performed the operation five times. All the patients recovered without any bad symptoms, although the tumour in one of them

weighed 70 lb. Dr TITLEY likewise was present at two successful cases; although one of them was accompanied with an adhering hernia, which required a tedious dissection to separate; and in the other there was a hydrocele on each side. I have already mentioned the three other successful cases by Mr LISTON, M. DELPECH, and Dr WELLS, constituting in all, eleven successful cases; including another successful case by Mr CLOT of Alexandria, not before mentioned, in which the tumour, after removal, weighed 110 lb., exclusive of a great quantity of fluid, which was lost during the operation.

Dr HENDY, in his account of the Glandular Disease of Barbadoes, details some cases which seem to be a modifica-

tion of this complaint in a more acute form, and as symptomatic of Elephantiasis. In the first case, the patient had suffered from Elephantiasis, attended by an attack on the left testicle ; there was likewise a swelling of the inguinal glands. Two hours after he was seized with rigor and violent pains in his loins. These symptoms were soon succeeded by heat, thirst, dry parched skin, quick pulse, and an increase of inflammation in the affected parts. It is unnecessary to detail the progress of this case minutely. It was treated on the antiphlogistic plan, when all the inflammatory symptoms gradually abated, the swelling in the testicle and inguinal glands completely subsided, and left the patient free from all complaint. Dr HENDY represents this case as affording an instance of the glandular disease

spreading from the scrotum to the testicle. But whether this conjecture be just or not, the progress of the attack is very different from that of the cases before described. — Dr HENDY describes the case of a Negro, in which the successive attacks had been confined to the scrotum, as he never had any symptoms of a diseased testicle. Before each attack the lymphatic glands, on both the thighs and groin, were enlarged, and painful for several hours. The fever was ushered in, with the usual symptoms of coldness, shivering, &c. and in about thirty hours went off with profuse sweating. But the inflammation of the scrotum came on with the hot fit, continued for several days, and always left behind it a proportional enlargement. For the first two years the attacks were frequent, and the increase of the scrotum

consequently very rapid ; afterwards they were less frequent ; but the enlargement from each was more considerable, and, from its enormous weight, he was sensible of a gradual increase even during the intervals ;—length 24 inches, circumference 6 feet. A mortification of the part put an end to the patient's life.—Mr CLOT, in describing the case at Alexandria, states, that it was a combination of the acute and the chronic form of the disease ; the tumour being subject to occasional fits of activity when it increased rapidly in size, while during the intervals between these fits it remained perfectly indolent. Dr HENDY states that he had five other cases, in which the scrotum, being much enlarged, sloughed, and left the testicles denuded. These cases being acute, exhibit more severe symptoms. A few terminate

unfavourably ; but their termination does not seem in the least under the control of medical treatment. How far in the last case it would have been prudent to operate during any period of the attack, is a very nice point to determine.

I have confined the preceding discussion to the more important and difficult cases of enormous tumours of the scrotum ; since if we once establish just principles of practice in these cases, there cannot be any doubt respecting the treatment of smaller tumours. Here we have to follow the well known rule of removing an incurable disease without delay. There is no risk of any inconvenience arising from the return of the disease in another part of the body, as this is a consequence which never has followed any cases of

operation which are upon record. Besides supposing these tumours to be of a similar nature with Elephantiasis, this apprehension would not be well founded, as there are instances of members affected with Elephantiasis being removed, without any return of the complaint.

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Steatomatous, scirrhous, and other tumours of various characters, occupy the same situation, being lodged in the cellular tissue between the integuments and the tunica vaginalis. When they are of a nature not to be resolved by medicinal treatment, there is no alternative but an operation. The operation is rarely followed by severe symptoms, or attended with danger. And when these accidents occur, they are, in general, to be ascribed to the unhealthiness of the patient's con-

stitution, or to the impaired state of his health at the time. There is, then, nothing peculiar with regard to the treatment of these tumours on account of their local situation, the danger being, in a great measure, proportional to the extent of the incision requisite to be made for their removal. It is not, however, a common situation for accidental tumours to appear; and there is not any particular difficulty in determining the treatment adapted to each individual case.

The diagnosis of tumours in the scrotum is attended with like difficulties as the diagnosis of tumours in other parts of the body. Accordingly, a collection of a fluid, when tense, and without fluctuation, has been mistaken for a solid tumour, but without the mistake producing any inconvenience.

The only other disease of the scrotum I mean to consider, is the Chimney-sweeper's Cancer, described by Mr POTT. Mr POTT is the first author who mentions chimney-sweepers as liable to this particular affection of the scrotum, owing, as he supposes, to the irritation excited by the constant application of soot to the rugæ of the scrotum. The complaint begins by the growth of a small tumour, known to the trade by the name of the *Soot-wart*, which, in the course of time, ulcerates, when it is converted into an eroding, painful, incurable ulcer, which at last terminates in the death of the patient. Unless the diseased part be removed by excision, the soot-wart, with a base about an inch in diameter, sometimes rises to the height of nearly three inches. Warts of this

large size have been removed with care, without producing much haemorrhage at the time of their removal, though a profuse haemorrhage has taken place some hours afterwards. Swelling in the glands of the groin, though a discouraging symptom, ought not to prevent an operation, if otherwise advisable, since there are instances of the swelled glands subsiding after the excision of the diseased parts. It is, however, necessary for the patient to relinquish the trade; for ample experience has shewn that exposure to the irritation of soot never fails to induce a relapse, while otherwise his cure is complete and permanent.

Cases of the Chimney-sweeper's Cancer occur frequently in the London hospitals, though very seldom at the Royal Infir-

mary of Edinburgh. I have seen but few cases of the disease. The Chimney-sweeper's Cancer would likewise seem to be of rare occurrence in Paris, as the authors of the Dictionary of Medical Science refer to the description of Mr POTT, without giving any additional information from the experience of the Paris surgeons.

## TUNICA VAGINALIS.

THE tunica vaginalis is liable to undergo various changes, in consequence of disease. Induration and increase of thickness, without any malignant tendency, are the most frequent of these changes. They are often conjoined, though not necessarily so. Partial indurations, with hardly any additional thickness, very frequently occur.

Increase of thickness may be the consequence either of an augmentation in the substance of the tunica vaginalis, or of the deposition of adventitious matter upon its surface. Of the former variety, HEISTER

gives an instance in which the tunica vaginalis was a finger-breadth in thickness. The case was the subject of an operation, after which the healing proceeded in the most regular and healthy manner. In the greater number of cases, however, the additional thickness arises from the deposition of albumen on the internal surface of the tunica vaginalis. These deposits are sometimes in the form of layers, like those which take place in cases of old aneurism. At other times, they are in the form of irregular solid masses, which adhere firmly to the tunica vaginalis. In this form, the disease very much resembles an affection of the testicles, with prominent elevations on the surface, for which it has occasionally been mistaken, and castration unadvisedly performed. As there are no pathognomonic symptoms

to distinguish the two diseases from one another, it is rash to proceed to castration, without previously dividing the tunica vaginalis, to ascertain the seat and nature of the disease. If the tuberculated swelling be found to consist of irregular indurated masses, adhering firmly to the surface of the tunica vaginalis, the surgeon should endeavour to separate them by dissection. The separation may be attempted with perfect safety, as the disease is not of a malignant nature, and the parts bear to be treated with great freedom. In proof of this I may refer to a case reported by DECKERS, in which the tunica vaginalis and tunica albuginea were covered by a stony concretion, adhering firmly to their surfaces. DECKERS, with much perseverance and considerable violence, succeeded in sepa-

rating the whole concretion. Yet this severe and tedious operation did not excite great symptomatic inflammation. And as albuminous concretions would be separated with greater facility and despatch, much milder consecutive symptoms might be expected.

Disease confined to the tunica vaginalis is not of frequent occurrence, as the surrounding parts, with which it is intimately connected, are in general involved. There are, however, several interesting cases, in which the tunica vaginalis alone was affected. SCHMUCKER relates one in the case of a dysenteric patient, who was attacked with a swelling in the region of the scrotum, supposed to arise from metastasis. Suppuration took place, and

when the matter was evacuated by an incision the tunica vaginalis was found discoloured. A lancet was pushed through it in expectation of discovering some deeper-seated collection of matter, but none was found. The testicle was sound. The tunica vaginalis, in the form of a mortified slough, was thrown out through the incision in separate portions, till the whole was ejected. After this the scrotum adhered to the testicle, and, contracting gradually in its dimensions, at last produced a firm and lasting cicatrix. The symptoms during the whole progress of the cure, were quite mild, the patient never having been distressed by any constitutional disturbance, nor was there ever any tendency to contaminate the neighbouring parts. This, however, is not always the character of

attacks upon the tunica vaginalis, as Mr ROUX\* describes a scirrhous affection of the tunica vaginalis bearing unequivocal symptoms of cancerous degeneracy. In such cases, it is necessary to remove all the diseased parts, including the testicle. For although the testicle appear sound at the time, yet it is not probable that it would escape the cancerous contamination, when parts immediately connected with it, and much less predisposed to cancerous degeneracy, were primarily affected.

Sir A. COOPER gives an instance of the tunica vaginalis having been affected with spongoid inflammation; castration was performed, when, upon dissection, the testicle and epididymis were discovered to be perfectly sound.

\* ROUX, Dict. du Med. art. *Sarcocele*.

The tunica vaginalis is liable to suffer from attacks of inflammation, arising either spontaneously, or excited by artificial irritation. In the cure of hydrocele by injection, the application of a stimulating fluid to the cavity of the tunica vaginalis excites an attack of inflammation, which in general abates gradually under the usual antiphlogistic treatment; though in some instances the attack is so severe as to produce mortification, and sloughing of the scrotum, or even to occasion death. Mr VAUGHAN has established a most instructive case of a gentleman, who, having contracted a gonorrhœa, was subsequently attacked with inflamed testicle. The attack, notwithstanding the most judicious treatment, terminated in the death of the patient; and as death rarely occurs from an inflamed testicle, Mr VAUGHAN em-

braced this opportunity to ascertain the state of the parts. In dividing the integuments and cellular tissue of the scrotum, he found a small quantity of purulent matter, emitting a very offensive smell. He now thought that he had reached the body of the testicle. But, greatly to his surprise, upon continuing the incision into the supposed body of the testicle, he discovered the tunica vaginalis to be two-thirds of an inch in thickness, with the testicle and epididymis lying in the vaginal cavity, not at all enlarged, and healthy in every respect. The case was seen by several of the most eminent practitioners of London, all of whom concurred in regarding the testicle as the seat of the disease. This mistake led to inert practice; for, had the actual state of the disease been suspected before death,

the surgeon would undoubtedly have divided the tunica vaginalis through its whole length, in hopes of relieving the tension, and of procuring a copious discharge of blood from the inflamed parts. This memorable case exposed the imperfection of surgery with regard to the diagnosis of inflamed testicle, without pointing out any discriminating symptom, which would prevent the recurrence of a similar mistake. Fortunately, indeed, our imperfect knowledge on this point does not lead to improper treatment, since, in the early stage of all cases, the indications of cure are the same ; and even in the later stage, when the case becomes critical, it is safe to make a deep incision into the substance of the swelling.

## HYDROCELE.

THE collection of a fluid within the cavity of the tunica vaginalis, is termed Hydrocele ; and, from its external situation, the simple structure of the parts, and the uniformity of the symptoms, in general admits of a distinct, well marked diagnosis. The date of commencement is often uncertain, for, as the hydrocele begins without pain, it does not attract notice, till there is a perceptible increase in the size of the scrotum. The swelling appears first at the bottom of the scrotum, ascending gradually to the lower opening of the inguinal canal. This is the natural pro-

gress in the accumulation of a fluid collecting gradually ; and as the tunica vaginalis is distensible, and the pressure from the effect of gravitation greater at the lower part, the lower part will be most distended, and consequently the swelling will assume a pyriform shape. This, accordingly, is the characteristic shape of a hydrocele, in a well-marked case. A sense of fluctuation is perceptible to the touch, when the hydrocele has attained considerable size, without being very tense. It is likewise translucent, when illuminated by a strong transmitted light. But in this examination, the room requires to be darkened, and the surgeon to be on his guard against permitting the interference of reflected light, which, by falling on the shaded side of an opaque body, gives it the appearance of transparency. Pressure upon

the site of the testicles communicates a peculiar sensation.

At the same time, it ought to be observed, that, although the existence of hydrocele may in general be determined with great accuracy, yet cases occasionally occur, attended with difficulty in the diagnosis, and even with the symptoms so obscure as to render the discrimination altogether impossible. A hydrocele may be mistaken for a disease of a very different nature, or, conversely, another disease mistaken for a hydrocele ; or, although the case be actually a hydrocele, it may be accompanied with singular circumstances, which are not disclosed at the time of the investigation. Thus a hydrocele retaining its transparency may, instead of containing a fluid, contain a col-

lection of hydatids. This case, though rare, I have known to occur, to the great embarrassment of the operator. A still more rare instance of a case of transparency not being an absolute criterion of hydrocele is mentioned by RICHTER, in the case of a patient who had a rheumatic swelling of the testicles, in which the affected testicle was transparent. The affection passed from the one testicle to the other, an alternation characteristic of rheumatic complaints. Besides hydatids, I have known an adventitious encysted transparent tumour adhering to the epididymis, and filling part of the tunica vaginalis. The existence of such a tumour is not known previously to the operation.

But the most frequent causes of diffi-

culty arise from want of transparency, either from opacity in the contained fluid, or from the preternatural thickness and consequent opacity of the tunica vaginalis. This latter is by far the most frequent. It is likewise, in general, accompanied with a degree of firmness, which prevents the fluctuation of the contained fluid, or the peculiar sensation of the testicle from being distinctly perceived. When the hydrocele is tense, and of long standing, it is frequently accompanied with occasional acute lancinating pains, resembling those of a scirrhous testicle. Under these imposing symptoms a hydrocele has been removed as a case of scirrhous testicle, when a subsequent dissection has shewn the testicle to have been quite sound, and castration unnecessary. So calamitous a mistake

points out the expediency of, in all cases, dividing the tunica vaginalis before proceeding to operate.

When the swelling extends to the aperture of the inguinal canal, the hydrocele resembles a scrotal hernia. The resemblance is more complete when the hydrocele swells suddenly in consequence of an external injury, by the swelling of the scrotum encroaching upon the abdomen, and being tense and discoloured. SAVIARD describes a perplexing case of this kind ; but I have seen one still more perplexing. A patient was admitted into the Infirmary with a large tense discoloured swelling of the scrotum, which, according to his account, had come on suddenly some days before, in consequence of a blow. He had not passed any fæces since the

date of the accident. All these circumstances corresponded perfectly with the origin and character of a scrotal hernia, which the case was concluded to be, as it was not then known that the patient had been affected with a hydrocele previously to the accident. When, however, this circumstance became known, especially as no pains nor tension of the belly, nor any symptoms of strangulation, supervened, it was thought safe to watch the natural progress of the complaint. In the course of a few days the swelling began to subside, which allowed a more satisfactory examination, to ascertain the true nature of the case, when all cause of alarm appeared to have proceeded from inflammation of the surrounding parts having been added to the previous swelling of the hydrocele

When the tumour of the scrotum is examined in a case of pulpy testicle, it communicates a sensation like that of a bladder half-filled with a fluid, and is supposed to be a hydrocele. Under this delusion a puncture is made to draw off the fluid, but no fluid is discharged; and a malignant fungus protrudes through the opening indicating the existence of an incurable disease. A surgeon, therefore, to save himself from the reproach of ignorance and mismanagement, should apprise the patient of the ambiguous nature of the case, so that he may be prepared to lose his testicle, if it be diseased. This precaution on the part of the surgeon is the more necessary, as hardly any patient recovers who has to submit to castration on account of a pulpy testicle.

Another cause of deception is presented by a singular modification of congenital hernia. In this case, the lower portion of the omentum in contact with the testicle became soft from mortification: this preternatural softness misled the surgeon, who, not being prepared to expect any such change, conceived the case to be a hydrocele. The mistake, however, did not occasion any serious inconvenience. The same peculiarity of structure which permits the omentum to come into contact with the testicle, likewise permits any fluid contained in the abdomen to descend into the vaginal cavity; by accumulating there it forms a species of hydrocele, which communicates with the cavity of the abdomen. The existence of this communication affords an infallible criterion to distinguish the two species of hydro-

cele from each other. Since by making the patient lie upon his back and by applying gentle pressure to the tumour, the fluid passes up into the abdomen. It is of consequence to ascertain the fact, since, if an attempt were made to cure such a hydrocele by injection, the stimulating fluid would pass into the abdomen and excite a dangerous peritoneal inflammation. **M. DESAULT**, as a matter of experiment, tried this practice in two cases; it succeeded in one, and proved fatal in the other.

In this species of hydrocele the fluid is actually collected in a protrusion of the peritoneum, and it might with equal facility collect in any other protrusion or old unreduced hernial sac. Accordingly, this modification sometimes occurs, forming a

swelling on the scrotum in the site of a common hydrocele, which might lead to a mistake. It may likewise occur in combination with a common hydrocele, and thus form a complex case. The case will be still more complicated, if a hydrocele of the spermatic chord exist at the same time. M. LE DRAN gives an instance of this complex combination ; and Dr MONRO relates a case still more complicated, in which four distinct tumours existed in one patient.

The preternatural thickness and rigidity of the tunica vaginalis prevent a surgeon from ascertaining the contents of the vaginal cavity. These are various ; but, excepting those already mentioned, are more matters of curiosity than of practical utility. For example ; a mass of hair has

been found in the cavity of the tunica vaginalis; in another case, a mass of cellular membrane. And many instances are recorded of cartilaginous and osseous bodies being found loose in the vaginal cavity. These bodies seem to be formed upon the same principle as those which are formed in the cavities of the joints. They grow from the surrounding surfaces, from which they are detached by accident, or by some natural process of separation.\*

The term Hydrocele implies a tumour filled with water; Hæmatocèle one filled with blood. The two cases do not differ from each other in any other circumstance.

\* Mr WARDROP, Medical and Surgical Journal, Edinburgh, vol. iii.

but their contents. But this circumstance alone has been thought by all systematic writers on surgery to constitute two distinct diseases. They are distinguished from other diseases by the same diagnostic symptoms, and require the same mode of treatment for their cure. With regard to the cure, it is requisite, when the blood has coagulated, to divide the tunica vaginalis its whole length, as is done in the radical cure of hydrocele, by incision.

Hæmatocele is, in general, the consequence of external violence, or of a wound by a sharp instrument. Sometimes, indeed, though rarely, it arises spontaneously, when the testicle is almost constantly found to be diseased, which alters the view of the case, by removing it to another

class of diseases. Making sufficient allowance for these modifications, the same remarks are applicable to both diseases.

In mentioning the symptoms of hydrocele, I stated that the swelling began at the bottom, and ascended gradually upwards. But this, though the general progress of the swelling is not universal, as I have known a case in which the swelling began at the top, and descended towards the bottom. I likewise stated, that, after the swelling attained its greatest size, it afterwards remained stationary. But this fact, too, is liable to exceptions; as I knew a case in which the hydrocele was more tense towards evening, after the patient had continued long in an erect posture, and more lax in the morning. These very rare exceptions from the ge-

neral law cannot, however, be considered as invalidating the accuracy of the general account of the symptoms of the disease.

Although the long axis of a hydrocele is commonly placed in a vertical position, the body of the patient being erect, yet I have known it horizontal, when the bulk of the swelling was lodged between the thighs, the apices projecting anteriorly and posteriorly.

The uniformity of the swelling, too, is sometimes disturbed, by contractions, at particular places, giving the hydrocele the appearance of a sand-glass. The communication between these two portions of the swelling is more or less distinct. Sometimes there is not any perceptible communication between them, when it

may become a matter of doubt, whether the case was originally a simple hydrocele, or a hydrocele combined with an encysted tumour of the tunica vaginalis. These circumstances require to be ascertained by an accurate investigation of the symptoms in every particular case.

The tendency of a hydrocele to increase is not circumscribed within any determinate limits. It sometimes attains a most enormous bulk. Mr CLINE drew off six quarts of fluid from a hydrocele on the person of Mr GIBBON, the celebrated historian. But by far the largest on record is one mentioned by MURSINNA, which was 27 inches in its long axis, and 17 in its transverse. The enormous size of this hydrocele almost exceeds the bounds of credibility ; I shall therefore

give the measurement in the author's own words :—“ Diese Geschwulst betrug in ihrer grossten Lange, von oben bis unten, drey Viertheil einer Elle, und in der Mitte, im Durchschnitt von einer Seite zur andern, eine halbe Elle weniger einem Zoll.” \*

The cause of hydrocele depends upon an overturn of the balance between the action of the exhalant and the action of the absorbent vessels of the tunica vaginalis. Either cause will produce an accumulation of a fluid collection. But a decrease in the action of the absorbents is the more frequent occurrence, as it is probably the cause of all the common

\* Neue Medicinisch-Chirurgische Beobachtungen, von Christian Ludwig Mursinna. Berlin, 1796.

cases of hydrocele which begin without pain, and which continue increasing, or at least remain stationary, from the relaxed absorbents never being able to regain their loss of tone: while the effusion, which so frequently takes place on the cure of hydrocele by injection, has all the appearance of being the effect of an acute inflammatory attack depending upon an increased action in the exhalants. When the violence of this attack subsides, the natural power of the absorbents is sufficient to remove the whole, or at least the greater part of the accumulated fluid. So that a cure of this secondary hydrocele, more or less perfect, almost constantly takes place.

Whatever may be the cause of the hydrocele, the particular case under consi-

deration may be either idiopathic or symptomatic of some other affection.—Mr POTT relates a very instructive case, in which the hydrocele was evidently dependent on a fit of gout, as the swelling disappeared along with the departure of the gout. And Sir E. HOME relates three cases symptomatic of an irritation in the urethra, in which the hydrocele disappeared upon the cure of the strictures.

Hydrocele, though a troublesome complaint, and very annoying from its unwieldy bulk, is rarely painful, and never dangerous. It occurs at all periods of life. Infants are occasionally born with hydrocele; but in them, or in children at an early age, the hydrocele often admits of a spontaneous cure, or its cure

may be promoted, and insured almost to certainty, by the application of stimulating embrocations. But hydrocele, in patients of advanced years, is a chronic, stationary complaint, which does not usually undergo any favourable change spontaneously. In a few cases, indeed, the accumulated fluid is completely removed by absorption.

Besides a spontaneous cure of hydrocele by the natural powers of the system, an accidental cure is sometimes obtained by the rupture of the containing parts. Dr DOUGLAS relates two cases of tense hydroceles, in both of which the tunica vaginalis gave way upon a slight inflexion of the body. The effused fluid escaped into the surrounding cellular membrane, from which it was speedily absorbed. A

like rupture is sometimes occasioned by external violence. In either case the cure is complete for a time, but not always permanent. In one case, in which the parts were greatly distended, not only the tunica vaginalis, but the integuments of the scrotum also gave way, in consequence of a great exertion. By this means the whole fluid was completely evacuated, and a permanent cure obtained.

The very frequent occurrence of hydrocele has afforded ample opportunity to try various methods of cure, and to ascertain their respective values.

The only mode of cure now employed consists in evacuating the fluid by an operation. This operation is more or less simple, according to the object which the

surgeon has in view. If his sole object be to evacuate the fluid, without using any precaution to prevent a return of the collection, he has only to make an opening into the cavity of the tunica vaginalis, by which the fluid escapes. The mere evacuation of the fluid, however, produces only a temporary, or what is in general termed a palliative, cure. It is, however, so easy, and for a time relieves the patient so completely, that it is often employed as a matter of convenience. It is simple and easily performed; but may prove troublesome or dangerous, by imprudence or mismanagement. If the surgeon is not sufficiently on his guard, he may wound the testicle, or the artery of the spermatic cord, which, by occasioning an unrestrainable hæmorrhage, has led to the loss of the testicle; or if, by undervaluing the

risk of irritation, an attack of inflammation has been excited subsequent to the operation, the consequences have proved fatal.

When the surgeon has a higher object in view, by using means to prevent a relapse, the cure is termed radical. This object is attainable in two ways: either by restoring the healthy action of the parts, or by obliterating the cavity of the tunica vaginalis. For this purpose, six different modes of operating have been employed. The temporary irritation of the tunica vaginalis by the canula or by a bougie; the introduction of a seton; the excision of the tunica vaginalis; the application of caustic; the injection of a stimulating fluid into the cavity of the tunica vaginalis; or a longitudinal division

of the tunica vaginalis through its whole length. The first four methods are now almost universally abandoned. I shall, therefore, confine my remarks to a comparison between the merits of the cure by injection, and the cure by incision. But whichever method is preferred, it is desirable to operate before the hydrocele has attained a large size; since, when the hydrocele is very large, the inflammation, by spreading over a more extensive surface, produces more violent symptoms. To avoid this inconvenience, it is usual to evacuate the fluid, watch the progress of the subsequent collection, and when the hydrocele has attained a convenient size, proceed to perform the radical cure.

The cure by incision is by far the most ancient, and the most generally employed.

The cure by injection has been more recently introduced. Between sixty and seventy years ago, Mr SABATIER, in the Memoirs of the Academy of Surgery of Paris, published an excellent dissertation on the cure of hydrocele, explaining particularly the cure by injection. About twenty years after, Sir JAMES EARL published an essay strongly recommending the cure by injection. His recommendation produced a powerful impression on the minds of the British surgeons, so that the cure by injection became the favourite operation. It has the advantage of being more easily performed, and of subjecting the patient to a shorter confinement. But, though the consecutive symptoms are in general more mild, yet a greater proportion of deaths happen in consequence of the cure by injection than

of the cure by incision.\* It is likewise more uncertain as to its efficacy, as the hydrocele sometimes returns more than once.† The possibility of these frequent returns affords a proof that the cavity of the tunica vaginalis is not obliterated. Indeed the frequency of the secondary

\* As the introduction of a stimulating fluid into the cellular membrane of the scrotum excites a high degree of inflammation, which occasionally proves fatal, the surgeon should be on his guard to avoid this accident by a careful management of the trocar and canula.

† With the view of converting a palliative into a radical cure, and conjoining mildness with permanency, Mr KEATE wrapped the scrotum, immediately after the eduction of the fluid, in cloths soaked in a strong stimulating embrocation. This practice, however, is not in general successful, and never gained the confidence of the profession. But, as it is quite safe, there cannot be any objection to give it a trial.

effusion, immediately after the operation, leads to the same conclusion. The cure by injection, therefore, must depend upon a change in the action of the parts, not upon an obliteration of the vaginal cavity. This opinion has the support of Mr B. BELL and Mr RAMSDEN.

The cure by incision, when properly conducted, accomplishes the complete obliteration of the vaginal cavity, which renders a relapse impossible. A gentleman who had the cure by injection performed without success, submitted afterwards to the cure by incision, and declared that the cure by injection was the more painful of the two. I have paid great attention to the subject, with the result of finding my confidence in the certainty and permanence of the cure by injection gradually

abate. The confidence of the London surgeons, too, so far as I can learn, is likewise on the decline; and on the Continent, the cure by incision is, I understand, generally employed. But for more complete information with regard to the comparative merits of the cure by injection and the cure by incision, I refer to a treatise published by Mr B. BELL in 1794. Upon the whole, I have treated the cure of hydrocele in a cursory manner, as the subject is discussed at full length in all systematic works of surgery, to which I beg to refer those who wish for more full information on the subject.

## DISEASES OF THE TESTICLES.

THE testicles, like other organs, are exposed to inflammation, either in its simple form, or as modified by rheumatism, gout, scrofula, or other constitutional diseases. These inflammatory affections of the testicles, amidst their different modifications, retain a generic character, whose leading features are dependent upon the peculiar structure and constitution of the testicles, their extreme sensibility under disease, their sympathetic connexion with other important organs, and the lively impression which,

when diseased, they make upon the imagination.

An inflammatory affection of the testicles is marked by swelling, induration, and pain in the region of the scrotum, not, in general, accompanied with discoloration of the integuments, at least at the commencement of the attack. The exterior detached situation of the testicles marks the limits of the attack. So far the diagnosis is obvious and certain. Still, however, there want data to determine whether the tunica vaginalis be the proper seat of the inflammation. And as, in such cases, death is a very rare occurrence, there are few opportunities of ascertaining this point by dissection. In one case,\* in which the examination was

\* Mr VAUGHAN's, see page 106.

made, the attack was confined exclusively to the tunica vaginalis, the testicles being perfectly sound. But this want of a criterion for discriminating between inflammatory affections of the testicles and of the tunica vaginalis, is not attended with any inconvenience in practice, since the same treatment is alike applicable to both cases. And the prognosis is favourable, in so far that a recovery, more or less perfect, almost constantly takes place.\* In general,

\* I was present at a consultation upon a case, produced by a blow, in which all the surgeons excepting one regarded the swelling as an enlargement of the testicles. The dissentient individual, admitting the imposing appearances of the case, stated, in support of his opinion, that he had lately seen a case attended with like symptoms, which proved to be a case of scrotal hernia, and that it would be most prudent to proceed on this supposition, which proved to be just.

the symptoms progressively increase in severity, till they have attained their acmé, after which they gradually decline till the parts regain their natural state. It is not, however, uncommon for a partial induration of the epididymis to remain after the cure is in other respects complete. It is more or less permanent, but does not seem to impair the functions of the testicles, or to produce any perceptible inconvenience. The discussion of this little intumescence and induration is often promoted by the use of mercurial ointment, applied for some time in small quantities.

An acute inflammation of the testicles may arise spontaneously, or be the consequence of exposure to cold, or of external violence, or of the application of chemical

stimulants to the surface of the testicles, which is a necessary step in the cure of hydrocele by injection. From whichever of these causes the inflammation may have originated, the principles of practice are precisely the same with the treatment of any ordinary attack of inflammation. The strict observance of a horizontal posture, with the testicles carefully suspended, and adherence to a low diet, together with general and local bleedings, corresponding to the urgency of the case, will in time effect a cure. But the patient must be admonished to bear his confinement with patience, since any premature exertion is certain to induce a relapse.

With regard to local applications, cold lotions may with advantage be employed in slight cases, which can be repressed at

their commencement. But in cases of greater severity, whose progress cannot be arrested, the application of cold seems to irritate. In such severe cases, the steam of hot water is a soothing and salutary application, which should be employed and persisted in till the violence of the attack abates. At this period, a transition may with benefit be made to cold lotions, which invigorate and confirm the tone of the relaxed parts. The feelings of the patient, according as they are agreeable or disagreeable, often afford a convenient index to determine the choice of cold or warm applications. Either application may have its efficacy increased by the addition of medicinal impregnations, of which a great number are in common use.

Whoever has the misfortune to be afflicted with a severe inflammatory affection of the testicles should be continent in his connexion with women, not only till his recovery be complete, but till his strength has been confirmed by a lapse of time; since a premature indulgence in his amorous propensities would inevitably induce a relapse, more difficult to cure than the original attack.

A venereal gonorrhœa is frequently accompanied with an inflammation of the testicle, which in this case is known by the name of *Hernia humeralis*,—a change in the nomenclature, which would be better avoided, as the two attacks correspond in all their symptoms, and only differ in the relation which the *hernia humeralis* bears to the state of the discharge from

the urethra. There is great diversity with regard to the period of the discharge at which the swelling of the testicle appears. Sometimes it appears as soon as the discharge. At other times the discharge has existed a long while, and the inflammatory symptoms have attained a great height before the testicles become affected. At another time the testicles do not inflame till the discharge has ceased, or even till after a considerable interval has elapsed between the cessation of the discharge and the affection of the testicles ; and instances are recorded in which the affection of the testicles appeared before the discharge from the urethra. This want of uniformity with regard to the date in the commencement of attack, renders it exceedingly difficult to ascertain the law which regulates the re-

lation between the affection of the testicles and the affection of the urethra.

The swelling of the testicles upon the cessation of the discharge, suggested the idea of the affections being vicarious. The transference of disease alternately to the testicles and urethra was also referred to metastasis, or the translation of morbid matter from the one to the other. This doctrine of metastasis, however, is not applicable to those cases in which the discharge from the urethra ceases before the swelling of the testicle appears, since, as there was not any collection of matter to be absorbed from the urethra, none could be transferred to the testicles. The same argument controverts the doctrine of the inflammation being propagated from the urethra to the testicles along the course

of the vasa deferentia. For, if inflammation were extinct in the urethra, it never could be the source of a new attack in the testicles. It is further evident, that when the inflammation of the testicles precedes the affection of the urethra, it must depend upon a very different principle. All we know upon the subject is, that a morbid poison is applied to the penis, and that, after lying dormant for some time, its effects become apparent in the production of various distressing symptoms. And that all the affections of the urethra and testicles are the consequences, more or less direct, of its influence upon the organs of generation. The existence of an intimate relation between the urethra and testicles is proved by a number of cases of daily occurrence, in which the relief of the urethra alternates with the

suffering of the testicles, and *vice versa*. But this alternation, though general, is not universal, and therefore cannot be received as a fundamental law of the system. There are two sets of cases equally incompatible with the doctrine of reciprocity. First, when the inflammation of the testicles does not commence till the discharge has continued for some time, and the discharge, instead of abating, proceeds without interruption in its ordinary course, the affection of the testicles following the same course, whereby a direct sympathy is established. Secondly, when, in the case of a testicle swelling upon the suppression of a discharge, the swelling does not subside upon the restoration of the discharge. Both these cases are alike inconsistent with the truth of the doctrine.

There is, however, sufficient evidence that the urethra and testicles are under the influence of the most delicate sympathy. A chronic obstinate swelling of the testicles often depends upon the presence of a stricture of the urethra, which passed unnoticed, as it neither had excited pain nor produced any difficulty in passing water. The testicle subsides upon the cure of the stricture. But this mode of cure cannot always be employed with effect, as the introduction of a bougie often excites intolerable irritation in the urethra, or affects the testicles, and prevents the continuance of the practice.

Another interesting fact, of an opposite character, occurs when a patient labouring under gonorrhœa receives a blow upon the testicle. The testicle swells, inflames,

and follows the same course as if no disease existed in the urethra: the two complaints keep as distinct as if the parts affected did not sympathize with one another.

The cure of hernia humeralis requires similar treatment with the cure of any other attack of simple inflammation. Those practitioners, indeed, who favour the doctrine of reciprocity, recommend the insertion of venereal matter into the urethra, when the hernia humeralis has appeared, upon the cessation of the discharge. The practice, however, has never obtained the confidence of the profession. Its advocates, too, do not give the same report of its efficacy; as some represent it to be serviceable only in recent cases, others only in those which are old and

obstinate. I have had an opportunity to witness the practice only in two cases. The result was unfavourable in both. In one, a medical gentleman, who tried the experiment in his own person, it excited a retention of urine so obstinate, as almost to induce the necessity of puncturing the bladder. M. DUPUYTREN, too, the first surgeon in Paris, does not approve of the practice, from his apprehension of the irritation likely to be excited by the insertion of an infected bougie into the urethra. I regard the practice as less applicable to recent cases, than to those of long standing; because, in recent cases, the urethra is in a state of inflammation and irritability very ill adapted to bear the irritation of a bougie; besides this, the testicles may admit of a cure by milder treatment. And one of the remedies, the steam of hot water

applied to the genitals, has a fair prospect of re-establishing the discharge, without exposing the patient to any risk of suffering from irritation.

Old obstinate cases are presented under a different predicament. Since in them the urethra is not preternaturally irritable, and the testicles having resisted all other methods of cure, the surgeon is justified in having recourse to means which, though attended with some risk, afford hopes of saving the patient from the calamity of losing his testicles by castration. M. ODENKIRCHER relates a most encouraging case of a patient who had a hernia humeralis of four years' standing, as large as two fists, and as hard as a stone, cured by allowing a bougie poisoned with venereal matter to remain in the urethra for

eight hours. But the effect of the practice is too precarious to admit of indiscriminate application,—though it may be expedient in certain cases, which the discretion of the medical attendant must be left to determine.

Another very interesting sympathetic affection of the testicles occurs in certain cases of *Cynanche Parotidea*,\* when the pain and swelling abate suddenly, and the affection is transferred directly to the brain, producing convulsions and other dangerous symptoms, which occasionally prove fatal. This translation of the secondary affection to an organ of a different class from the one primarily affected, is a very singular deviation from the laws

\* 'Mumps' in England, 'Branks' in Scotland.

which regulate vicarious affections. Another remarkable peculiarity of this affection is the injurious effects of free evacuations, a practice naturally applied to a case characterized by all the symptoms of active inflammation. Yet it seems a fact well established by those who have had experience in this disease, that the copious detraction of blood brings on those dangerous attacks upon the brain, which admit of relief only by a discharge from one of the organs originally affected. This practice, with the most satisfactory result of relieving the brain from oppression, has been put directly to the test of experiment, by the application of blisters behind the ear, and to the region of the parotid gland. Blisters, indeed, have never, so far as I know, been applied to the testicles, though, from the striking

analogy of circumstances, there is great encouragement to try the practice. For the spontaneous resolution of this sympathetic affection of the testicles is accomplished by a copious discharge from the surface of the scrotum; while the suppression of this discharge, either by exposure to cold, or by the application of repellent medicines, induces a translation of the attack to the brain, accompanied by the usual disastrous consequences.

Besides the above peculiarities, there is a distressing tendency in this sympathetic affection to cause a decay of the testicle. In these unfortunate cases, the decrease of the swelling does not stop when the testicle has been reduced to its natural size, but continues uninterruptedly till the substance of the testicle is com-

pletely wasted, nothing remaining but an empty bag, very sensible to pressure or to any kind of irritation. There are very few cases in which there is only a partial reduction of size. I recollect but one instance of this variety.\* M. RICHTER gives a very curious history of a kind of rheumatic swelling of the testicle, in which the cure was effected by the swelling subsiding below the natural size of the testicle, which, however, afterwards regained its healthy size. But this is a recovery which the patient has little reason to expect. The only well authenticated case of this is given by SAVIARD, who, in performing an operation for the radical cure of hydrocele, found the testicle so completely shrunk, as to be concealed between

\* Dr HAMILTON's paper upon 'Mumps.'

the folds of the tunica vaginalis. Upon the cure of the hydrocele, however, the testicle regained its original size.

Fortunately the decay of the testicle is not a disease of frequent occurrence, so that the information on the subject lies scattered over the works of surgical authors, few of whom have seen more than two or three cases of the disease. Baron LARREY is the only person I know who has had practice in it upon any thing like an extensive scale, and his account of the disease is exceedingly interesting. After the return of the army from the Egyptian expedition, many soldiers complained of the disappearance of the testicles, without any venereal affection. The testicles lost their sensibility, became soft, diminished gradually in size, and

seemed to be dried up. The attack, in general, began in one testicle at a time. The patient did not perceive this decay till the testicle was reduced to a very small size; it approached the inguinal canal, and was about the shape and size of a horse-bean. It was indolent, and of a firm consistence. The spermatic cord itself diminished in size, and partook of the atrophy. When both testicles were affected, the patient was deprived of the faculty of procreation, of which he was apprised by the absence of all desire, and by the laxity of the parts of generation. This loss influences all the interior organs. The inferior extremities become lean, and totter under them; the countenance becomes discoloured, the beard thin, the stomach loses its tone, the digestion is impaired, and the intellectual fa-

culties deranged. Several soldiers with this infirmity were invalidated.

This complaint is ascribed to the excessive heat of the climate, the fatigues and privations of war, and above all, to the use of spirits made from dates, in which different species of *Solanum* were infused. The ancients are said to have procured the atrophy of the testicles by the continued application to the scrotum of the insipid juice of hemlock.

When the atrophy is complete, art does not offer any resource; but at its commencement, the distressing consequences may be prevented by the use of vapour baths, dry friction over the surface of the body, urtication of the thighs, refreshing stomachic remedies and good diet.

A person may be secured against this accident, by abstaining from the immoderate use of women and spiritous liquors. Since the return from Egypt, LARREY had occasion to treat this malady in many soldiers of the imperial guard, who brought it upon themselves by like excesses. In one person, this malady had, in a very short time, attained an extreme degree of malignity, insomuch as to make both testicles disappear almost entirely. The patient, who heretofore was of a robust constitution, with a thick beard and prominent features, lost all character of virility, and presented the appearance of an effeminate being ; his beard was thin, his voice exceedingly feeble and shrill ; his genitals without action, and incapable of generating. All means of cure proved ineffectual.

Similar symptoms have been produced by deep wounds upon the nape of the neck.

The preceding account is by far the most full and distinct of any I have met with in surgical authors. At the same time, the account both of the cause and the cure of the malady is much too vague to be at all satisfactory. It is somewhat singular that the French troops, who, in Egypt, led a debauched enervating life, were the only persons afflicted with this malady. The confidence expressed in the method of cure in the early stages, does not appear to be supported by experience.

Mr J. HUNTER, in his book on the venereal disease, gives three cases of decay of the testicles. Two of the cases only

were under his own care. One case was subsequent to an attack of swelled testicles, in consequence of gonorrhœa. The other two cases came on without any known cause. In the most distressing case, both testicles were affected. One was attacked a year before the other with symptoms of pain and swelling, which terminated in the complete decay of the testicle. Upon the second being attacked, Mr HUNTER was consulted. Some pills, with calomel and tartar emetic, were tried, in hopes of increasing the secretion of the glands in general, and of making some change on the testicle. These seemed at first to be of service, but soon lost their effect, and the testicle began to decrease just as the other had done. Mr POTT and Mr ADAIR were then consulted along with Mr HUNTER, but nothing

could be thought of that gave any hopes of success. Mr HUNTER advised him to try electricity, and to employ the parts in their natural uses, as much as inclination led him, with a view of putting a stop to the unnatural actions; but all to no purpose,—the testicle continued to waste till not a vestige was left.

Mr POTT, likewise, in his remarks upon Circocelle, reports the case of a patient who lost both his testicles by spontaneous decay. One has less difficulty in conceiving the pernicious effect of circocelle upon the testicles, than more general and remote causes. The termination of the case was unfortunate; and Mr POTT hardly ventures to suggest any means of cure. When men of the first abilities, and of the most extensive experience, ac-

knowledge their ignorance of any practice which can be recommended with confidence in the cure of a tendency in the testicles to decay, we may suspend placing much reliance on the vague measures which Baron LARREY recommends, without producing a single instance of their efficacy.

Excessive venery is represented as an exciting cause of this atrophy ; while, on the contrary, abstinence from all connection with women, or uninterrupted continence, has been supposed to produce the same effect. There is nothing inconsistent with the laws of nature, in two opposite extremes destroying the functions of an organ. And this may possibly obtain in the case of the testicles, though the evidence of the fact is not, so far as I know,

established upon a sufficiently extensive induction. Supposing it true, the case should not be so hopeless as the other variety, since, by encouraging the patient to employ the parts in discharging their natural function, if the disease be not confirmed, there is a probable prospect of recovery. In the case given by SAVIARD, the shrinking of the testicles was ascribed to the pressure of the fluid, and therefore did not indicate any radical defect in the testicle. In cases of hydrocele in which the testicle undergoes any change, it is usually that of enlargement. One other case of the diminution of the testicle in hydrocele is recorded, in which the surgeon removed the testicle, supposing it useless and irrecoverable. His practice, in this respect, was precipitate, since the result of SAVIARD's case gave sufficient encourage-

ment to expect a favourable termination ; at least, it would have been prudent to have watched the progress of the case with patience. The rashness of the surgeon in this instance, demonstrates the advantage derived from an extensive and intimate acquaintance with the facts recorded by our predecessors, as this knowledge may enable us to treat a case judiciously, which otherwise might be regarded as quite new, and without any previous experience to regulate our practice.

'There is a solitary case by Dr GREENFIELD of a patient with a decayed testicle, cured by the internal and external use of cantharides. The testicle had decreased to the size of a filbert nut ; but, after the cure, it had recovered its natural magnitude.

The decay of both testicles is one of those melancholy catastrophes which makes a deep and indelible impression upon the mind of the sufferer. Unfortunately, too, it is one of those cases in which the interposition of art has not hitherto been able to afford any effectual relief; nor is the prospect of discovering any method of cure very flattering, as the cases occur too rarely to afford an opportunity of investigating the subject fully in all its bearings, so as to ascertain which mode of practice is the best. At present, therefore, we must regard decay of the testicles to be a disease beyond the power of art to remove.

In the forms of decay which I have hitherto been considering, there is no change produced in the external appearance of the parts, the testicles merely decreasing

in size. But in another form, the coats of the testicles burst, and the whole vascular substance is expelled, so that nothing but an empty bag is left. A case is given by MORAND,\* in which an abscess in the testicle burst, and from its cavity a quantity of a whitish substance was discharged. This substance could be drawn to the length of several yards, and in character and appearance corresponded perfectly to that of the *tubuli semeniferi* of the testicles. M. PETIT is the first author who gives a distinct account of this affection. He made an incision into the body of the testicle, and drew out the whole substance by a mistake, which he has the candour to confess. He was afterwards called into consultation with another practitioner,

\* Opuscules, Part ii. p. 171.

who had committed a like mistake. Dr MONRO mentions a similar case,\* in which, upon making an incision through the tunica albuginea, the convoluted fibrous substance of the testicle started out in a very soft pappy condition, and putrid. A considerable quantity of this substance was cut off with a pair of scissors, and more continued to protrude daily till the quantity protruded fully equalled the bulk of a healthy testicle. The cure went on successfully, so that one cannot now say which testicle is diseased. Mr ACRELL† also advert's to this complaint, and gives an account of the symptoms and progress very similar to the preceding. I never had occasion to witness an instance of this

\* Med. Ess. Ed. vol. v. p. 270.

† Vol. i. p. 468.

kind of destruction, in the course of my own experience. But I have known the accident of drawing out the whole substance of the testicle happen in the hands of a very judicious practitioner. Unfortunately, he had not been prepared to meet the occurrence, by a previous knowledge of what had happened to others. It is therefore very desirable that those rare, interesting, and important cases should be communicated in a form which would make the information easily accessible. The disease which produces this tendency to protrusion does not contaminate the constitution. But, when the whole substance of the testicle is extracted, one cannot believe in a regeneration taking place, to supply the deficiency. It is, therefore, difficult to determine the nature of the change which took place in

the case recorded by Dr MONRO, where, after the cure, no difference was to be perceived between the two testicles. That the patient was sensible of no defect, proves nothing, since universal experience shows, that the removal of one testicle does not impair the amorous desires, nor the powers of generation. I regard this form of destruction to be quite hopeless and incurable.

The testicle has likewise been found completely wasted, after the termination of a tedious severe fever. In this case, there is not any intimation of the approaching evil given by previous alarming symptoms; it is accidentally discovered. I have had an opportunity to witness this form of the complaint, but do not know its nature.

## NERVOUS AFFECTIONS OF THE TESTICLES.

IN the two preceding affections, the affection of the testicles was the offspring of sympathy with other local diseases, through the intervention of the nerves. But besides those arising from sympathy, the testicles are subject to idiopathic nervous affections, which I shall now consider.

All nervous affections, more especially those of the testicles, make a deep impression upon the imagination. They are perpetually present to the mind of the patient, who magnifies their importance, and, by foreboding a progressive aggravation of

the disease, still farther diminishes his already impaired enjoyment of life. I have known a patient rendered quite miserable by the overpowering effect of this state of mind, while, in a professional point of view, the case was not considered to be of a serious nature, nor likely to be attended with danger. A gentleman put himself under my care, on account of a slight intumescence of the testicle, with some swelling and induration of the epididymis, accompanied with a degree of irritability, which made him exceedingly uncomfortable. The most inconsiderable external pressure excited intolerable pain and distress. He could not take exercise without feeling inconvenience, as every exertion aggravated his sufferings. In other respects his health was not impaired, if we except the appearance of some intimate

connection subsisting between the affection of the testicle and the state of his mind; for, along with his bodily distress, a morbid anxiety of mind was induced, which exasperated all his feelings, represented every thing in the most gloomy colours, and often rendered him incapable of attending with steadiness to his usual occupations. This mental irritation more than corresponded with the appearance of disease in the testicle; so that the imagination had a great share in producing, or at least in aggravating, his distress. Nor was there any possibility of preventing him from thinking perpetually of his complaints, though, in other respects, he was a man of uncommon fortitude and vigour of mind.

Complaints marked with a signal degree

of irritability are more immediately connected with some depraved mode of action, than with any organic change in the state of the parts. And this consideration leads to a more favourable prognosis in such cases, as complaints which partake much of a nervous tendency, are in general characterized by a considerable degree of mutability. So that, although the predominant symptoms are gradually getting better, yet the progress of amendment is exceedingly slow, and often interrupted by occasional relapses, which any accidental circumstance is capable of inducing. The patient, therefore, continues long in a valetudinary state; and after all the vexation of this tedious recovery, the cure is not so stable for a considerable time after he supposes himself well, as to exempt

him from the risk of a return upon any over-exertion or trifling want of caution.

The intumescence of the testicle is a conclusive proof of an afflux of fluids towards it. But this afflux may be attended with very different circumstances. In some cases, the swelling takes place slowly, is indolent, and unaccompanied with any change of colour. The parts affected, instead of being endowed with a preternatural degree of sensibility, are, if any thing, less sensible than in a state of health. The swelling is not disposed to undergo any sudden change, and, in so far, is chronic. Another class of swellings is characterized by an increased activity in the bloodvessels, some change of colour in the skin, more or less pain, and some slight increase of sensibility. But this

increase of sensibility is not considerable, and seems entirely dependent upon the preternatural state of the circulation. When the action of the bloodvessels is restored to a state of health, the increased sensibility ceases. In such cases, therefore, the state of the vessels is the predominating feature in the complaint, and that from which it takes its character. This is the form of attack which is most apt to extend its influence, and to produce constitutional symptoms, which have more or less of a febrile type.

In the modification of the complaint more immediately under consideration, the nervous symptoms bear a far greater share. And although there is a degree of intumescence connected with the state of the vessels, the predominant symptom is

a singular degree of irritability, depending upon the state of the nerves. The intumescence connected with the condition of the vessels may, doubtless, have a share in supporting or aggravating this morbid irritability, since it is a well-known fact, that the tension of a part increases its sensibility. So that, although the morbid state of the nerves may have been the original cause of the swelling, yet the swelling, after it is formed, may support and increase the morbid irritability to which it originally owed its existence. I have not had sufficient experience in the disease to determine the progress which it would follow, if left to its natural course.

In laying down the indications of cure, it follows, from the doctrine delivered with regard to the nature of the disease,

that, although the nerves be the primary cause of the complaint, yet that considerable advantage may be derived from removing the fulness and tension of the testicle; and that the accomplishment of this object is a matter of importance in the topical treatment of the case. With this view, leeches should be occasionally applied. General bloodletting is not required, as there is no constitutional affection, no fulness of the system, no general increased action of the bloodvessels. As motion of all kind, especially much exercise in an erect posture, increases the patient's suffering, it is of consequence to enjoin constant rest in a horizontal position. Preparations of cinchona and iron, given in such dozes as agree with the patient's constitution, are the best general remedies. Cold bathing is a very power-

ful auxiliary, which may be used with great advantage. It is likewise of importance to keep the patient in a cool atmosphere, as a high temperature is relaxing, and favours the accession and continuance of nervous complaints. Great attention likewise should be paid to the state of the chylopoëtic viscera, to support the tone of the stomach, and to keep the bowels freely open, since indigestion has a most pernicious effect upon all nervous complaints. The patient's diet should be mild and nutritious, moderate in quantity, and not of a stimulating quality. Upon the same principle the patient should abstain from fermented liquors and ardent spirits of all kinds. With regard to local applications, the most appropriate are astringent anodyne applications, employed cold. By continuing this treatment steadily, the

morbid irritability is gradually subdued, and the parts restored to a state of health. But the suppression of the distressing symptoms cannot be regarded as a complete cure, unless the health of the parts be so fully confirmed as to exempt them from the risk of a relapse. This confirmation is the work of time.

As a measure of precaution, the patient should wear a suspensory bandage for a considerable time after he has begun to move about. In all other respects he should cautiously avoid every kind of irritation or irregularity which has the smallest chance of injuring his health. The above mentioned treatment succeeded with the case to which I particularly allude, and seems well adapted to this character of the complaint. I knew of

another case, in which the patient appeared to derive benefit from a gentle mercurial course. But my experience on this interesting disease is too limited to entitle me to describe its varieties and different modifications with their respective appropriate treatment.

In the form of affection hitherto considered, there are obvious symptoms of disease in the testicle indicated by the general intumescence, accompanied with swelling, and induration of the epididymis. In the form which I next proceed to consider, there is not any apparent deviation from a state of perfect health, no swelling, no induration, no change of colour. The sole symptom of disease consists in paroxysms of excruciating pains, more or less frequent in their return, te-

dious in their duration, or violent in their degree. This variety corresponds perfectly with a purely nervous symptom, such as occurs in other parts of the body, and is distinguished by the name of Neuralgia. The result of long continued and extensive experience is, that no infallible cure is known for Neuralgia, or that, speaking more correctly, Neuralgia is, by all the most respectable practitioners, acknowledged to be a disease incurable by internal or external remedies. After exhausting the whole catalogue of remedies, and meeting with nothing but disappointment, the case must be abandoned as hopeless, unless some benefit can be derived from an operation. Thus, then, is the question to be determined, in the treatment of neuralgia of the testicle; for, in respect to its intractable nature, neuralgia

of the testicle is precisely in the same predicament with neuralgia in any other part of the body.

If the disease be seated in the organ in which the pain is pungent, and circumscribed to a limited extent, then there could not remain any doubt respecting the expediency of recurring to a surgical operation. But if the apparent fixture of the pain be a delusion, and if the pain, which seems to be seated in the testicle, be in reality derived from the centre of sensation, and seated in the brain, then the removal of the pained parts would not be of any avail in relieving the patient from distress. Either condition may take place. Since it is a well known fact, that pains which have their origin in the brain, are referred to the extremity with

perfect belief of their existence in a hand or a foot, long before separated from the body. This is a question which does not always admit of a satisfactory solution, as there is not any established criterion which enables a practitioner to determine this point in an individual case. The existence, however, of both conditions is ascertained by the result of surgical practice. The practice to which I refer is the complete division of the nerve which connects the seat of the pain with the brain. When this operation is successful in removing the pain, it affords undoubted evidence that the disease is local and circumscribed, and the cause of the suffering seated in the part where the pain is felt. In such cases the operation of dividing the nerve proves an effectual and permanent cure. If, on the other hand, the

division of the nerve does not procure relief, then it is evident that the true cause of the disease is not seated in the place of the pain, but either diffused more generally over the nerves in the neighbourhood, or confined exclusively to the brain. In either case the operation is abortive, or only produces partial and temporary relief. Under such circumstances, therefore, the practice is inadvisable. But as this knowledge cannot be obtained, and as the pathology of the case is involved in obscurity and doubt, a surgeon is placed in a difficult dilemma when he is called upon to give his advice in a case of obstinate and intolerable neuralgia, which has resisted every other means of cure, so that no resource is left but in an operation. An excruciating pain of the testicle imbibers life, without any pros-

pect of relief, except by the removal of the testicle, supposing it to be the true seat of the pain. But as this is a matter of uncertainty, no prudent practitioner will urge the operation. If, however, the patient, after being fully informed of all the circumstances of the case, wish to have castration performed, a surgeon is then completely justified in giving this chance of cure, without incurring any particular responsibility. I was once concerned in a case of this description in the person of a medical practitioner, who came to town from a distance, with the view of submitting to the removal of his testicles. After his arrival he was put under a course of medicines, which was not of the smallest service; and as his medical friends had no farther measures to recommend, and as his sufferings were intolerable, he finally resolved

on the operation. Accordingly it was performed with the most fortunate success, as he was instantly relieved from pain, which never afterwards troubled him. He recovered his health, strength, and spirits, which had been impaired by the severity and continuance of his complaint.

A practitioner, remarkable for the soundness of his judgment, encouraged by the success of the preceding case, adopted a similar practice in a like case, which, however, was not followed by an equally favourable result, as the patient experienced but imperfect relief in the first instance, while the complaint returned, gradually increasing in severity, till at last it attained its original violence. The next case that occurred here was

treated upon other principles. The practitioner, one of the most eminent in town, perhaps influenced in his judgment by the unfortunate issue of the last case, advised the patient to submit to his sufferings with patience, in hopes that time would at last accomplish a cure. The patient followed this advice, and was relieved from his misery in the course of eighteen months.

On considering the history of the three preceding cases, which are all that have come to my knowledge as having occurred at Edinburgh, it is evident, that the fortunate termination of the first and third cases was beyond what the parties were entitled to calculate upon. In the first case, supposing that the chances were equal, which is the only just supposition

in our present state of doubt and uncertainty, it was fortunate to get a prize when only one of two cases could be expected to succeed. The patient who was the subject of advice in the third case, was still more fortunate, as there was much more than an equal chance against his obtaining a spontaneous cure in the course of eighteen months, comparing the rarity of so favourable a termination, with the frequency of the disease remaining during life with unabated violence.

In three cases of irritable testicle, Sir ASTLEY COOPER performed castration at desire of the patients.

I have now to consider those cases symptomatic of a constitutional disease, though the existence of the constitutional

disease does not always appear in the production of any other symptom. This obscurity with regard to the true nature of the disease occasionally occurs in cases of gout and rheumatism. ALIX records a most instructive case of this kind. A patient applied to him with a severe affection in both testicles, which, without effect, he treated as a case of simple inflammation. But, having been informed that the patient followed an occupation which exposed him to the vicissitudes of heat and cold, and that he had formerly been subject to rheumatism, he changed his practice, treated it as a rheumatic case, and soon effected a cure. In another case,\* a swelling and pain of the testicles was relieved by the pain flitting to the joints,

\* Medical and Physical Journal, vol. lxi. p. 370.

the patient becoming attacked with general rheumatic fever.

RICHTER mentions a singular modification of a rheumatic affection of the testicles. The swelling flitted from one testicle to the other. But the most curious circumstance was, that of the attack making the affected testicle partially transparent, an effect of which I do not know another instance.

The testicle is likewise liable to be affected by gout very much in the way it is affected by rheumatism. From a characteristic difference, however, between the two diseases, the origin of the attack is often more completely concealed, so that nothing appears to excite suspicion till the supervention of gout in other parts of

the body relieves the testicles, and develops the mysterious nature of the case. In some cases of this kind, the attack has commenced with a sudden swelling of the testicle, which was remarkable for its extreme hardness and weight. These symptoms being by some surgeons regarded as pathognomonic of a cancerous scirrhus, have led to the unfortunate practice of removing the testicle by castration. I have seldom in the course of my own experience had occasion to witness an attack of gout in the testicle, but the attacks which I have witnessed were marked with the impenetrable hardness, and increase of weight, so characteristic of the complaint. A gouty affection of the testicle is rather a rare occurrence, so that there is not any appropriate treatment established for the cure.

Obscure as is the nature of the connexion between gout or rheumatism and affections of the testicle, the dependence of an affection of the testicles upon that unknown state of the atmosphere which produces an epidemic disease is still more obscure. Mr WEDDOWS gives a distinct history of an epidemic swelling of the testicles which occurred in the neighbourhood of Wallingford. At least, the number of individuals affected in a short space of time was so great, as to render it reasonable to ascribe the coincidence to the effect of some common cause. The disease was not dangerous, all the patients recovering under the usual method of cure.

The diseases hitherto considered are of a transient nature, none being followed by change of structure. It is indeed true

that some of the simpler diseases occasionally degenerate into serious organic affections. Thus a common inflammatory swelling of the testicle, which has not entirely subsided, will, after a lapse of years, assume a state of activity, and betray malignant symptoms.

The terms *Sarcocele* and *Scirrhous* are often employed in a sense so vague as to create confusion respecting diseases of the testicles. In this vague use of the term, *Sarcocele* comprehends not only diseases of the testicles, but likewise diseases of other neighbouring parts, which have not any connexion with the testicles. The careless use of the term *Scirrhous* errs in the opposite extreme, extending one peculiar disease of the testicles to a whole class, which agree in their similarity only

in a single point. *Scirrhous*, in strict propriety of technical language, means merely an induration. But in the ordinary acceptation of the term, when applied to diseases of the testicles, it implies that malignant scirrhous which terminates in an incurable cancerous ulcer, proving ultimately fatal. But besides this dangerous species of scirrhous, there are many other varieties, which have nothing so malignant in their nature, and are either curable or produce chronic disease, which, however distressing, are not fatal. This unfortunate misapplication of the term has, however, often led to the disastrous practice of removing the testicle. In the following remarks, the term *Sarcocele* will be applied exclusively to denote diseases of the testicle, and the term *Scirrhous* to

denote a general state of induration, unless a specific epithet be added.

The diagnosis of chronic cases is exceedingly difficult, as most of them have many symptoms in common, and no one possesses a pathognomonic symptom which belongs to it exclusively. Some of the diseases are of so obscure a nature as not to manifest their presence by any external symptom, and only to be known from having an opportunity to examine the intimate structure of the testicles. In others, although there is a marked deviation from the natural state, yet the locality of this deviation cannot be ascertained by examination when the scrotum remains undivided. Thus, a supposed enlargement of the testicle, with a supposed

tuberculated surface, may be produced, either by an irregular swelling in the body of the testicle itself, or by the accretion of some adventitious matter to the surface of the tunica albuginea, while the testicle itself is free from disease. This form of disease, distinguished by the name of *Cara adnata ad testem*, is very frequently mentioned by the earlier writers in surgery. But the much more general, and much more important, class of cases, are those in which a surgeon can form only a presumptive opinion with regard to the nature of the disease. This numerous class includes the simple chronic enlargement of the testicle, uncontaminated by any specific morbid action. Or the enlargement may be connected with scrofula, or with a latent venereal taint in the constitution, or with a malignant scir-

rhous affection, which will ultimately degenerate into an incurable ulcer, or it may be a case of medullary sarcoma, the most dangerous of all diseases which invade the testicles; or it may be produced by the growth of hydatids in the body of the testicle. Sometimes, indeed, without any considerable morbid enlargement, the testicle is converted into a mass of fat, or of cartilage, or of bone.

Want of caution has led to the removal of a sound testicle. Thus an indurated enlargement of the scrotum, attended with occasional lancinating pains, is, in general, regarded as an incipient case of cancerous scirrhus. Upon this supposition many testicles have been removed, which were upon dissection discovered to be perfectly sound; the pains having arisen from a

distention of the tunica vaginalis in a case of hydrocele. In those cases, therefore, the surgeon had been precipitate in his practice; for, although the presumption might be in favour of the disease being a malignant affection of the testicle, yet the surgeon ought not to be so confident in the correctness of his opinion as to proceed to perform castration, without previously laying open the tunica vaginalis, to ascertain the point. More recent and accurate observation has shown, that diseases of the testicle which require castration are much fewer than was once supposed. A most gratifying discovery, which, leading to a more cautious practice, has been the means of preserving many testicles. But though a genuine scirrhouss testicle be a rare occurrence, yet every attack which creates a suspicion of its exist-

ence is alarming, and ought to be watched with the utmost care, since no maxim is better established in practice than the expediency of removing a cancerous testicle whenever its existence is unquestionable. The progress of a cancerous scirrhus is characterised by its tendency to form adhesions with the tunica vaginalis, to fall into an unhealthy suppuration, to ulcerate and produce an external sore before it attains a large size. So that if a testicle attain a large size, without undergoing any of these morbid changes, the probability is, that the disease is not of a cancerous nature, more especially if the patient does not suffer from any constitutional affection ; for cases of genuine cancer affect the constitution very seriously, by producing general emaciation, attended with a leaden-coloured countenance,

impaired appetite, loss of strength, and sometimes other symptoms of deranged health. When none of these symptoms of constitutional disease are present, and the patient is distressed merely by the inconvenience of the local affection, it is safe to continue watching the progress of the attack till some symptom supervenes which removes the doubt. For experience has fully shown, that, even after the most advanced stage of the attack, the removal of the diseased testicles will restore the patient's health. This restoration is in itself a decided proof that in these cases the disease is entirely local. For the purposes of practice, it is not necessary to discuss the general question, whether cancer be a constitutional or a local disease, since it is a sufficient vindication of the practice, for a surgeon to

produce instances of complete recoveries having been accomplished by castration after the most advanced stages of the disease. When local and constitutional symptoms are combined, there often is a doubt with regard to the order of their succession. But this uncertainty does not lead to any ambiguity in practice, as the surgeon is justified in recommending castration, since, in the one case, it effects a complete cure, and, in the other, it does not render the patient's situation more unfavourable.

The rate at which a cancer of the testicle advances in its progress is exceedingly various. I have known the disease prove fatal in the course of three months after its commencement; while, in other cases, the disease will undergo very little

change in the course of a great many years. In these comparatively indolent cases the symptoms sometimes remain almost stationary for a long while, and then, without any obvious cause, suddenly assume a state of activity, and afterwards proceed with great rapidity to a fatal termination. Under these circumstances, it is necessary to proceed to castration without delay.

The disease termed *Fungus Hæmatodes*, or *Pulpy Testicle*, is the most malignant of all the diseases to which the testicle is subject, and of much more frequent occurrence than cancer. It is somewhat singular that a disease of so malignant a nature should not have been distinguished from others till of late. Mr CHESTON, in his *Pathological Inquiries*,

published in the year 1766, is the first author who, so far as I know, has given a distinct description of the disease. The symptoms of fungus hæmatodes, or soft cancer, are widely different from those of common cancer. It commonly begins in a most insidious manner, not attracting the patient's notice till it has attained a considerable bulk. It continues enlarging without any notable symptom, and without any limits to the progress of its growth. But after a certain period, the patient's general health becomes affected, and the scrotum becomes a soft mass, which is often mistaken for a hydrocele not very fully distended with the effused fluid. This delusive appearance shows that a pulpy testicle does not always betray the malignancy of its nature at an early stage of the attack. From the marked progress

of this insidious disease, many instances have occurred of a swelling in the scrotum, which proved to be a case of pulpy testicle, having been punctured for a hydrocele. The frequency of these mistakes prove the difficulty attending the diagnosis, and should be a lesson to surgeons not to content themselves with a superficial examination of any case upon the belief that the disease is well understood, and the nature of it not likely to be mistaken. It is some false notion of this kind, with regard to the facility of distinguishing a case of hydrocele, which has misled so many surgeons in the treatment of cases of pulpy testicle. Although the feeling of a bladder partially filled with water is employed as a standard of comparison to describe the symptoms of a pulpy testicle, yet, upon accurate examination, the sensation

which the two cases communicate is not quite similar. The pulpy testicle, though soft and yielding at the place where the pressure is applied, does not communicate a sense of fluctuation to a distant part with equal distinctness. This difference alone should be sufficient to raise a doubt in the mind of the surgeon, and, in any ambiguous case, the patient should be apprised of the difficulty, that he may be prepared to submit to immediate castration, if unfortunately the disease should prove fungus haematodes. For, under these unfavourable circumstances, there is not any time to be lost, not only from the wound in the testicle proving a source of irritation sufficient to induce unhealthy activity, and give rise to the growth of fungous excrescences, or in other respects to aggravate the distress of the local com-

plaint, but likewise from the necessity of removing the diseased parts with all possible despatch, on account of their tendency to contaminate those that are sound. Even supposing this high contaminating power to be a matter of conjecture, not established by an extensive and accurate induction of facts, still the only hope of success rests upon early castration. It is not even known whether this precaution will afford security, as I am not acquainted with any well-authenticated case in which the patient has long survived the operation. There are, indeed, several equivocal instances of success, which, though sufficient to encourage surgeons in repeating the trial of early castration, do not inspire any very confident hope of a favourable result. It is, however, the only resource in those unpromising cases, and

therefore should be resorted to as a matter of prudence. The want of success from the operation in general, depends upon other important organs having been previously affected with this intractable disease.\*

\* The case of ROBERT AULD, admitted into the Royal Infirmary on account of a swelling in the left groin, is most interesting, from its obscure and complicated nature. The tumour was said to have arisen suddenly, in consequence of a blow, and was slightly discoloured on its surface. It bore the appearance of an inguinal hernia. No diminution of the tumour followed the application of leeches, or of cold lotions. It was then opened, when a quantity of coagulated blood, apparently partially organised, was removed. There was a considerable haemorrhage, and afterwards a fungous growth sprung up from different parts of the surface, which undermined the patient's health, who died exhausted. No testicle was found in the scrotum. This case may probably be regarded as an instance of fungus haematodes of the testicle, complicated by its detention in the inguinal canal. The case is

The above are the only two diseases of the testicle in which castration becomes indispensable, or even in general advisable. I have, in more than one instance, known castration recommended by most experienced surgeons, when, from the unwillingness of the patient to submit to the operation, the advice was not followed, and a cure afterwards obtained by medicinal treatment. This improvement in practice is not only conformable to my own experience, but is farther confirmed by the experience of others.

It is farther found, that the substance of the testicle may be divided in various

fully stated by Sir GEORGE BALLINGALL, in his "Clinical Lectures," a work distinguished by much practical good sense, applied to a judicious selection of cases.

directions with deep and extensive incisions, without having its functions destroyed as an organ of generation. A most instructive case of this kind is related by MR INGHAM. The patient had received a blow upon the testicle, which suppurred. The suppuration was ultimately healed, leaving several deep fistulous openings, discharging a gleety matter. In this state the patient married, but never had any seminal emissions. There was, however, a more copious discharge of the gleety matter for some days after coition. The sinuses, some of which penetrated above an inch into the testicle and epididymis, were all laid open to the bottom and healed, when the testicle regained its healthy action, accompanied with copious seminal emissions. My own experience would lead me to form a like con-

clusion, so that I would be exceedingly reserved in advising the removal of a testicle. Although the testicle appears to be an organ of great sensibility, when exposed to external contact, yet the parenchymatous substance does not excite much pain upon being divided by free and deep incisions. The consideration, therefore, of subjecting the patient to severe pain, need not deter a surgeon from making the freest incisions into a testicle.

Although a cancerous scirrhus does not naturally attain a large size, yet a simple enlargement of the testicle, which has already attained a large size, may become cancerous, as well as any other part of the body. The previous existence of disease renders the testicle less able to resist the invasion of any new morbid action, so that

it need not be a matter of surprise if a large swelling of the testicle occasionally degenerates into cancer. Such degenerations, however, very rarely occur.

Enlargement of the testicle is very frequently connected with a scrofulous taint in the constitution. The degree in which the scrofulous contamination enters into the character of the attack, varies much in different cases. In some, its effects are hardly discernible, while in others, it predominates so powerfully, as to produce a modification of disease, which is distinguished by the name of a scrofulous testicle. The affection, in these cases, frequently commences with an attack of active inflammation, which soon terminates in the formation of several separate abscesses. These abscesses burst, forming sinuses,

which lead to the centre of the testicle, discharging scrofulous matter, and showing little disposition to heal, unless they be laid open to the bottom ; a practice which may be safely followed, as the incisions heal rapidly and kindly, although they have been numerous, extensive, and deep.

In acute attacks of scrofulous inflammation, the body of the testicle is not uniformly affected ; those parts which are to run into partial suppuration are previously the seat of those phlegmonic swellings and indurations which precede the formation of an abscess, soon attach themselves to the investing membranes, and thus become incorporated with the integuments of the serotum. They produce an inequality on the surface of the testicles, which, by some, is assumed as a characteristic

symptom of a scrofulous affection. In general, however, scrofulous enlargements of the testicles of this description are more slow in their progress, begin insidiously, without any marked symptoms at their commencement, and only become painful in their more advanced stages, when they become subject to attacks of acute lancinating pains like those of cancerous scirrhus. From their similarity in these characters, they have been treated as malignant diseases, and the testicle removed, under a mistaken notion of the case. For, upon dividing the testicle, it exhibited the appearance of a scrofulous affection, sometimes containing a quantity of purulent matter in the centre. This collection of matter is in some measure a proof of a scrofulous contamination, as a simple inflammation of the testicle is not dispo-

sed to suppurate. These cases have lasted for years, before the testicle became so much diseased as induced the surgeon to operate. But before proceeding to castration, it would be a prudent precaution to make a deep incision into the substance of the testicle, to ascertain the nature of the disease. If it be discovered to be cancerous, then the surgeon should proceed immediately to castration; if it prove scrofulous, an incision will procure the discharge of any collection of matter; or, if the case has not proceeded to suppurate, it may relieve the patient, by removing the tension of the tunica albuginea. If the body of the testicle swell, without a corresponding distension of the tunica albuginea, the pressure from within acts as a perpetual source of irritation. The division of the tunica albuginea allows it

to retract, which relieves the tension ; and the subsequent suppuration produces a diminution in the size of the testicle.

In severe attacks of scrofulous inflammation, the progress of the disease sometimes resists every means of cure, and produces a deep, extensive, fungous ulcer, bearing a general resemblance to a cancer. The ravages of such a case sometimes include and destroy the testicle. It may then become expedient to remove the diseased parts by excision, as nothing valuable is lost by their removal, and the disease is otherwise incurable, and a source of perpetual uneasiness.

But it happens much more frequently, that the scrofulous contamination is so slight as not to communicate any pecu-

liar character to the attack. The enlargement attains a very great size without ulcerating, or without requiring any method of treatment different from what would be employed in the simplest form of an inflammatory attack. There is always, in these cases, a degree of indolence, which agrees best with stimulating remedies. This practice is so effective, that I have known several cases which I thought incurable, and in which I even thought castration advisable, cured by the repeated use of large blisters. This, therefore, is a remedy to which I would always give a full trial before I recommended castration.

The use of electricity, also, has in some cases proved highly beneficial, although the class of cases to which it is applicable has not yet been determined. But, as it

seems a perfectly safe remedy, I am not aware of any objection to its use in indolent cases. For in varying the practice, though without any determinate object in view, the surgeon has sometimes the good fortune to accomplish a cure beyond his most sanguine expectation.

In these cases, too, the use of mercury, both externally and internally, often proves a most powerful remedy. I have known cures accomplished by persisting in the use of mercury for a long time, and pushing it to a great extent, in cases in which nothing particular was known with regard to the nature and origin of the complaint. To avoid so serious a distress as castration, every rational attempt should be made, even at the risk of exposing the patient to considerable temporary inconvenience.

When any circumstances lead to a suspicion that the attack is from a venereal origin, the use of mercury should be pushed with more steadiness, and to a greater extent. From the concealed nature of venereal complaints, this is often a difficult point to determine. Mr ROUX, in the report of his professional journey, observes, that the surgeons of London regard a certain pyramidal form of the swelling as characteristic of a venereal origin, and that he had made the same remark himself, before he held any communication with them on the subject. I cannot speak to this point from my own observation.

Some chronic enlargements of the testicles, the consequence of a venereal gonorrhœa, although they have not any

thing in their nature properly syphilitic, have been found to yield to the effect of venereal irritation excited in the urethra. ODENKIRCHEN\* records a very memorable case of this kind.

Twenty-four years ago, Mr LAWRENCE published a short essay upon a peculiar fungous affection of the testicles, which he had not found described in any of the systematic works on surgery. I can confirm the truth of this remark, since Mr LAWRENCE's essay is the first distinct systematic account with which I am acquainted. Previously to the appearance of the fungus, the testicle swells, becomes painful, and preternaturally hard. This attack is in general the consequence of

\* See page 151.

some external injury, though, in a few cases, it arises spontaneously. One part of the surface is more prominent than the rest, and continues advancing, till at last the integuments give way, when a fungous growth protrudes through the opening. This fungus is of pretty uniform appearance in the different cases; though there is often some difference in the nature and quantity of the discharge, and in the aspect of the granulations. I have seen a considerable number of cases which resembled one another very nearly in their shape and dimensions. Their form was nearly circular, about an inch and a quarter in diameter, and three-eighths of an inch in height. As the singularity of their appearance attracted my attention, I made drawings of a good many of them, and was very much struck with their si-

milarity to those given by Mr WADD. In almost all the cases which I have seen, the fungus appeared at the upper part of the testicle. After the protrusion of the fungus, the uneasy feelings abate, and the complaint does not afterwards undergo any rapid change. In this state it has very much the character of an indolent chronic complaint. It does not produce any general constitutional disturbance, nor any swelling in the inguinal glands, and very rarely affects the spermatic cord, and even that not incurably. It possesses all the character of a local disease, without any disposition to spread, and without betraying any symptoms of a malignant nature. From all these circumstances, Mr LAWRENCE is disposed to think that the testicle, if left to itself, would gradually get well, and the patient

obtain a spontaneous cure ; but that the progress of the cure would be so slow, that it is expedient to employ curative measures to accelerate its completion.

The affection of the testicle, and subsequent protrusion of the fungus, seem, in some cases, to be sympathetic of an irritation in the urethra. I never saw a testicle removed on account of this affection. But the cases of castration which are recorded, show that the disorganization was much less than had been expected, or that the fungus had arisen from the tunica albuginea, leaving the body of the testicle quite sound.

Excision, ligature, the most powerful escarotics, or even actual cautery, may with safety be used to destroy the fungus.

Hæmorrhage has, in a few instances, followed excision, but never to a great extent, nor so as to be difficult to stop. In like manner, the application of a ligature has, in some cases, excited pain ; but the pain was not so severe as to produce nervous symptoms, and was not permanent. A few cases were more complicated and tedious, requiring different modes of treatment before the fungus was completely destroyed ; but I never knew an instance in which the destruction of the fungus was not accomplished at last. I have known actual cautery frequently employed, without exciting any great distress, and always with effect.

When the fungus is destroyed, and the wound heals, the cure is said to be complete, though the testicle be very much

diminished in size, and may have lost its organic powers. This suspicion is confirmed by the result of one case, in which the patient, after having suffered an attack in the right testicle, subsequently had one in his left, when he immediately lost all his venereal propensities. It is probable that, in all cases, the powers of generation are impaired, though this effect does not appear so long as the other testicle remains sound. Mr LAWRENCE says that he has seen so many cases of this affection, that he presumes that every surgeon of extensive practice is conversant with it. The presumption is quite plausible; though, in the instance of the Royal Infirmary, the admissions were so irregular as to render it exceedingly difficult to make a correct estimate of the average numbers. I had attended a great many

years before a case occurred ; then, for several successive years, admissions were so frequent, that I have known three or four cases in the Infirmary at a time. But this multiplicity lasted only for a few years, and now a great many have elapsed since a single case has been admitted ; so that it is very much a matter of accident whether a surgeon shall meet with many or few cases during several years' attendance upon an hospital.

When an enlarged testicle is not contaminated by any secret malignant disease, and the general health is not impaired, the diseased testicle may remain for a very great length of time, attain an enormous size, and at the end of an indefinite period be removed with safety to the patient's life, although very far advanced in years.

Mr WHITE gives two very memorable cases illustrative of this point. The tumour, in both, was of an enormous size, hanging down to the knees, and had existed for above twenty years. The patients were each of them above seventy years of age. Yet, under all those unpromising circumstances, they submitted to castration, which was in both cases performed with perfect success.

These cases are so far encouraging as to remove all grounds of despair, in cases which would naturally be thought desperate. But the unexpected success in such cases does not justify so long indulgence in expectative inert practice; since, for many years previous to the operation, the patient must have experienced intolerable inconvenience from the bulk, weight, and

uneasiness of the diseased testicle. The prodigious variety in the rate of progress and degree of malignity in diseases of the testicles, is very interesting to practitioners, and opens an extensive field for exercising their sagacity in discovering the real nature of the case under their consideration.

Other changes in the intimate structure of the testicle, are not made manifest by any external symptoms cognoscible by examination. The hydatid testicle is one of those varieties. The testicle enlarges without pain, and continues to increase in size, becoming uneasy from its increased bulk and weight, but without affecting the patient's general health. The hydatids, upon dissection, are found to occupy various situations.

Sometimes they surround the testicle, lying in immediate contact with the tunica albuginea, without immediately disturbing the organization of the glandular structure ; though the progressive enlargement of the hydatids must at last inevitably destroy all regular organization. When the hydatids are lodged in the central parts, the destruction of the glandular structure takes place sooner. It is obviously an incurable disease, which does not admit of any alleviation, or any retardation of its progress, by medicinal or surgical treatment. I have very rarely met with cases of hydatid testicle. The conversion of the testicle into fat, cartilage, or bone, are changes not indicated by any external symptom, and, though they were known, there is not any means of preventing them.

Besides the preceding diseases which affect the body of the testicles, there are others of a very different character, which are exterior to the tunica albuginea. They produce a swelling, marked with elevations and depressions, and upon examination are conceived to proceed from a tuberculated swelling of the body of the testicle, as they are not characterised by any distinguishing symptom. The true nature of the case, therefore, is not discovered till the tunica vaginalis is divided, in preparing to perform castration. The singular appearance of the surface of the testicle then attracts notice, when the irregularity is found to proceed from an adventitious growth adhering to the surface of the testicle. The nature of these growths is very various. Sometimes they

are warty excrescences irregularly dispersed over the surface; sometimes the growth is more uniform. None of them, however, so far as I know, are of a malignant nature. There is no danger in the experiment of removing them, since, if it does not succeed, the patient is not in a worse condition than he was before, and can at last only be reduced to the necessity of submitting to castration. I should therefore be an advocate for making every exertion to save the testicle by the removal of all the adventitious growth. The surfaces of the tunica vaginalis and tunica albuginea will, in the event of a cure, form adhesions, which effectually prevent the occurrence of a hydrocele at any future period.

'The only other morbid affection which

now remains to be mentioned, is a certain state of thickening and induration of the tunica albuginea. M. ROUX is said, by the authors of the 'Dictionnaire de Science Medicale,' to have paid particular attention to this disease. But I never have enjoyed an opportunity of seeing an instance of it, nor is the subject as yet fully investigated. It is, however, ascertained, that the tunica albuginea may be deeply affected, without the diseased action being propagated to the body of the testicle. It further appears that, in these cases, the tunica albuginea is exclusively the seat of pain, the parenchymatous substance of the testicle being naturally of an insensible character. In some cases of adventitious growth, which have been the subject of operation, a slough has separated from the surface of the tunica al-

buginea in the course of the cure. But how far this could be promoted by escarotic applications, is a point not yet ascertained. Under certain conditions the experiment might be tried without exposing the patient to any unjustifiable hazard; and every allowable experiment should be made, which has a chance to alleviate the complaint, and save the testicle. In like manner, the effect of making a longitudinal incision of the tunica albuginea is unknown, and is a practice which would probably be tried before the case was abandoned as hopeless. But all these suggestions are too much matters of conjecture to be insisted on.

When all means of cure fail, when the disease is progressively getting worse, and

when it has attained a height which would render it imprudent or unsafe to allow the testicle to remain unremoved, the only resource consists in castration.

## DISEASES OF THE SPERMATIC CORD.

THE spermatic cord is not often the seat of disease; those which occur are troublesome, and often difficult to discriminate, but never attended with danger.

The cellular tissue of the spermatic cord is occasionally distended with a serous effusion, which produces a swelling, in some cases bearing an imposing resemblance to an omental hernia, and in others to a case of hydrocele of the tunica vaginalis. This diversity in the appearance of the tumour arises from the fluid being contained either in original cells, each of them distended to a preternatural size, or in a general cavity formed by the rupture

of several cells. In the first case, it may at its commencement present a near resemblance to a bunch of grapes, from the prominence of the distended cells at the surface of the skin. This appearance is exhibited at that portion of the cord contiguous to the lower aperture of the inguinal canal; but it does not continue long in this state, since in the course of its progress the surface, which originally was tuberculated, at last becomes uniform, when it bears an imposing resemblance to an omental hernia. The other modification, or encysted hydrocele of the spermatic cord, occurs at the portion contiguous to the scrotum, which, in the ordinary attitudes of the body, is the most dependent, and consequently exposed to support the weight of the superincumbent fluid. The pressure of this fluid has been suppo-

sed to rupture some of the lowermost cells, and thus produces a general cavity at the bottom of the cord. According to this etiology, both an encysted and a diffused swelling of the cord may exist at the same time. It is, however, most usual and most convenient to consider these two diversities as distinct modifications of the disease.

Most patients, who present themselves with a hydrocele of the spermatic cord, represent themselves as afflicted with hernia, because both diseases occupy the same part of the body. Hernia is of very frequent occurrence, and well known to the public; while hydrocele of the spermatic cord occurring but rarely, the nature of it is not generally understood, so that it is almost invariably confounded with hernia by ignorant and unprofessional men. Even

practitioners of experience often find much difficulty in ascertaining the true nature of the case. The best method of conducting the investigation, is to place the patient in a horizontal posture, when the size of the swelling diminishes by part of the fluid passing into the abdomen. It may be assisted in this progress by the pressure of the hand upon the external tumour.

The effusion may either take place in that portion of the cord which is external to the inguinal canal, which is the most frequent variety, or it may extend towards the loins, enlarging that portion of the cord which lies within the parietes of the abdomen. In the first case, the lower aperture of the inguinal canal is not enlarged by dilatation, and the tumour

has a distinct commencement exterior to the lower aperture of the inguinal canal; from thence it proceeds downwards to the testicle, gradually extending in its dimensions as it descends, thus assuming a pyramidal shape. It is without elasticity, feeling soft to the touch. If moderate pressure be continued for some time, the swelling diminishes in size, from the effused fluid being pressed up through the inguinal canal. But if the pressure be removed, the hydrocele gradually regains its former size, whether the patient be in an erect or in a recumbent posture. In this case, too, the spermatic cord can be distinctly felt at its exit from the inguinal canal. The symptoms above enumerated correspond with those of an omental hernia. There is the same shape, the same degree of firmness, and the same want of

elasticity, in both cases. The reduction, too, may often be accomplished with equal ease. A hernia, however, after it is reduced, does not in general return when the patient remains at rest in a recumbent posture. But if the hydrocele have formed adhesions to the sac, then the hernia will be drawn back to its former state. In certain singular varieties, in which a portion of the omentum is converted into vesicles, the examination of the two cases will, to the touch, present exactly similar sensations.

When the hydrocele of the cord extends to the testicle, it occupies a situation somewhat exterior and posterior to the testicle, and never descends so far down as the bottom of the scrotum. By an accurate examination of the swelling, there-

fore, the testicle may, by its firmness and sensibility to the touch, be distinguished at the lower part.

When the effusion extends towards the loins, the inguinal canal is dilated, and a tumour may sometimes be discovered at the lower part of the abdomen, occupying the space between the upper orifice of the inguinal canal and the spine of the ileum. The numerous points of coincidence between the symptoms of omental hernia and diffused hydrocele of the spermatic cord occasion great difficulty in the diagnosis. In the determination of this diagnosis SCARPA confesses that our art is defective. And POTT, in detailing three cases, says that there was one of which he was not able to ascertain the true nature

till he had an opportunity of examining the patient's body after death.

An encysted hydrocele of the spermatic cord presents a different character in several respects. It is more prominent at a particular place, so that it may be seized and moved upon its attachment, and it does not undergo any change in its size or in its situation by the application of pressure. The particular spot which it occupies is accidental, varying from the lower aperture of the inguinal canal to the testicle. When the sides of the cyst are thin, then gentle patting with the finger sometimes communicates a sensation as if the tumour contained air, or was a pneumatocele. When the sides have acquired density and thickness, the pressure of the

finger does not make any impression upon the tumour, which is not affected by handling. In this state it is sometimes taken for a solid tumour, possibly of a malignant nature, yet capable of removal by an operation. If the encysted hydrocele of the spermatic cord occupies the region of the scrotum, it may, at first sight, counterfeit the appearance of a hydrocele of the tunica vaginalis; though, upon a critical investigation of symptoms, the true nature of the case may be ascertained, by finding the testicle more distinctly than in a case of common hydrocele. There is one complaint from which the discrimination is less obvious. RICHTER describes a case, in which an insulated encysted tumour was lodged in the cellular tissue between the skin of the scrotum and the tunica vaginalis, which had not any connexion either

with the cavity of the tunica vaginalis, or with the cells of the spermatic cord.

The hydrocele of the spermatic cord is a disease of rare occurrence, so that its existence is not suspected in the first instance. And as few surgeons have much knowledge of the disease from personal experience, they are not well qualified to investigate the nature of the case by the usual modes of investigation, and therefore more liable to make mistakes in their diagnosis.

Diffused hydrocele of the spermatic cord is sometimes a local disease, in other cases symptomatic of a constitutional dropsical affection. In the latter case, it follows the result of the general disorder, and consequently is not a proper subject

of surgical practice. As a local disease, it has not a natural termination in recovery ; though a few cases, in young subjects, have been cured by the application of stimulating remedies, aided by the assistance of continued gentle pressure. A truss has sometimes been applied, under a mistaken notion of the disease ; but this mistake does not lead to any bad consequences. External applications, however, aided by the most efficacious treatment, do not produce any salutary change in the case of adults, which admit of a cure only by an operation. The encysted hydrocele of the spermatic cord does not, in any instance, undergo a change either by internal or external remedies.

The cure of the complaint, therefore, can alone be accomplished by an opera-

tion, which may be either palliative or radical. The palliative consists merely in the evacuation of the water, without any attempt to prevent a subsequent accumulation. The quantity drawn off by a simple puncture is sometimes very great, no less than eleven pints. The object of the radical cure is to obliterate the cavity, by a longitudinal incision the whole length of the tumour. The operation is simple, and easily performed, and from the nature of the parts divided may be supposed free from danger. But this does not appear to be the case. Accordingly, Mr BOYER notices the occasional unfavourable results as an inducement to be shy in advising the operation. Mr POTT operated in seven cases, and in two the operation proved unfortunate; one a case of diffused, the other of encysted, hydrocele. In neither

was there any symptomatic inflammation, both patients dying in the manner of persons who sink from loss of blood. Unless, therefore, a patient suffer from pain, or be annoyed by the bulk of the swelling, and unable to follow his usual occupation, it is better to tolerate the inconvenience, than submit to an operation which is not free from danger. It is likewise inadvisable to attempt an operation for a radical cure, when the patient is affected with any organic or constitutional disorder, or labours under an infirm state of health. From the above circumstances, there is rarely occasion to perform the operation for the radical cure of hydrocele of the spermatic cord.

Pneumatocele, or a swelling of the scrotum from the presence of air, is mentioned

by the older writers on surgery as a familiar occurrence. DIONIS gives a distinct account of two varieties. One in which the air is lodged in the subcutaneous cellular tissue, as in a case of common emphysema, producing an elastic swelling, which pits upon pressure, and is attended with a crackling feeling and sound. Another, in which the air is lodged under the dartos muscle, producing a tense circumscribed swelling. BONETUS describes a case of this kind, which attained the size of a child's head. It arose without any known cause, continued for six months, and then disappeared spontaneously. A case of pneumatocele is not represented to be a distressing complaint. It does not produce any change of colour, nor any preternatural heat, nor annoy the patient, excepting by its bulk, which is rarely so

large as to make the annoyance considerable. It is a complaint of indefinite duration, and in general goes off spontaneously, without leaving any inconvenience behind. Its departure may be accelerated by the use of stimulating applications. I have never seen a case of pneumatocele. But I have, in other parts of the body, met with tumours filled with air, and I do not know any reason why an emphysematous tumour may not arise in the scrotum as well as any where else. Independently, too, of any analogical considerations, there seems, from the concurring testimony of so many able practitioners, sufficient evidence to establish its reality. Some of the most respectable modern surgeons discredit the existence of Pneumatocele. Few of the more recent systems

of general surgery mention the subject. Mr PORTAL, indeed, alludes to pneumatocele as a disease in whose existence he believes, but does not state whether he ever saw a case of it. Pneumatocele is a disease which impostors often counterfeit by inflating the scrotum. Soldiers likewise practise this fraud.

The class of diseases next to be considered are those affecting the vessels of the spermatic cord, all of which may be included under the name of Circocoele.

Circocoele is a swelling in the course of the spermatic cord, extending from the abdominal aperture to the testicle. It is of a pyramidal shape, being narrower at top and wider at bottom, and somewhat

flattened on its anterior surface. It extends gradually in all directions, becoming laterally longer and more prominent. There is not any limit to the distance it may reach, nor to the magnitude it may attain. As the swelling extends upwards, it enters the abdominal ring and distends it, and descends down to the testicle, covering the epididymis. On examination, it does not present any firm resistance to the pressure of the finger, the superficial parts yielding, so as to allow a firmer substance to be felt towards the centre. When grasped between the fingers, it has the feel of a number of cylindrical bodies twisted together, which have been compared to a bundle of earth-worms, and corresponds perfectly with the sensation which a convolution of bloodvessels would communicate. This symptom naturally

suggests the idea of the swelling being occasioned by a varicose state of the spermatic vein ; an idea which is confirmed by the circumstance of the size of the swelling varying with the attitude of the patient,— becoming more prominent and tense in an erect posture, and subsiding in a horizontal one. At this stage of the complaint, the superficial veins of the scrotum often attain a magnitude which renders them visible upon inspection. This varicose state of the veins of the scrotum, strictly speaking, constitutes the disease termed Varicocele. It is not of a dangerous nature. In general, it is symptomatic of a swelling in the scrotum, a disease in the spermatic cord, or some other affection. As an idiopathic complaint, it is of rare occurrence, and of little importance. Upon this account, it has not attracted much notice from prac-

titioners, who seldom distinguish it from the circocoele, which, by the generality of writers on surgery, includes both complaints. Nor does this want of precision in technical language produce any inconvenience in practice ; as a varicose state of veins of the scrotum seldom produces inconvenience which deserves to be considered as disease.

The descending portion of the circocoele, which envelopes the epididymis, produces a prominent swelling there, which may easily be confounded with an idiopathic affection of the epididymis and testicle, or true Spermatocele. The long continuance of a circocoele, in general affects the epididymis with disease, as a consequence of the morbid state of the veins, and slow return of the blood. When one disease

depends upon the previous existence of another, it is not surprising to find it included under the same name. In this way, circocoele comes to be employed as a generic name, including both varicocele and spermatocele.

The commencement of a circocoele is in general obscure, as it rarely is attended with pain at first, is very slow in its progress, and therefore seldom attracts notice till it has attained a considerable size. But though an incipient circocoele does not excite any sensation amounting to pain, it causes an uneasy feeling and sense of weight in the scrotum, which travels along the course of the spermatic cord, producing similar dull feelings in the loins. Neither is the swelling, after it has become perceptible, painful upon pressure.

Such are the ordinary symptoms and progress of a circocoele. But in other cases, the circocoele is ushered in by very prominent symptoms, which precede the appearance of the local swelling. The commencement is sometimes marked by a most acute pain in the loins, similar to a violent inflammatory attack, which, though relieved by active antiphlogistic treatment, does not terminate till a circocoele is formed. In this case, the formation of the varicose swelling of the spermatic vein is quite sudden. It is likewise sudden under a very different commencement, in which the patient is attacked with cold and shivering, like a paroxysm of intermittent fever. It does not, however, appear that the character of the circocoele is at all affected by those very different modes of commencement.

Although circocoele be in general an indolent tumour, it is, in some few cases, attended with pain, at times of the most excruciating severity. In some instances, those attacks of pain are accompanied by the sensation of intense heat, like burning coals. In some cases, in which the circocoele is in general indolent, the patient is occasionally attacked with acute pains lancinating through the substance of the tumour. A smart attack of circocoele on one side of the scrotum is sometimes accompanied with retraction of the testicle upon the other side, which swells, and becomes painful and indurated.

When a circocoele attains a large size, it becomes heavy, and, by its weight, presses the spermatic cord upon the os pubis. This pressure necessarily impedes the re-

turn of the blood, and increases the evil. The power of the cremaster muscle is not adequate to keep the testicle properly suspended, and prevent this. It is, therefore, an inconvenience which is perpetually increasing, and becoming daily more troublesome.

All authors agree in representing circocoele as more frequent in the left side of the scrotum than in the right. The cause of this difference is ascribed to the pressure of the colon, and the less favourable course of the spermatic vein for the discharge of its blood.

As a disease of the spermatic veins, which enter into the intimate structure of the testicle and epididymis deranges their organization, and produces spermatocele;

so, on the other hand, an idiopathic affection of the testicle and epididymis produces disease in the same venous extremities, and this affection, extending gradually to the trunk of the spermatic vein, causes circocoele. In this way the complication of circocoele and spermatocele (or what PETIT terms Varicospermatocele) has two very different origins. The celebrated RICHTER is a strenuous advocate for the latter origin, which he considers as the foundation of all cases of circocoele. In proof of this opinion he adduces cases of undoubted idiopathic spermatocele, uncomplicated with any affection of the spermatic vein. In one case, a young man of an amorous constitution, conversing with a young lady with whom he was deeply in love, had his libidinous desires so highly excited as to produce all

the symptoms of spermatocele. The complaint was not permanent, though, so long as it lasted, the character was complete. But though RICHTER proves the possibility of the case, he by no means proves that it is the only source of circocoele. Facts which establish the opposite doctrine, are numerous and unquestionable. Large varicose tumours have been found upon dissection, or have been removed by operation, in which both testicles and epididymis were quite sound. Such tumours have likewise existed for twenty years, without affecting the testicles or epididymis.

The diagnosis, in cases of circocoele, on account of the prominent character of the symptoms which distinguish it from other diseases, is seldom attended with difficul-

ty; yet there are certain forms of some other diseases, which bear a very imposing resemblance to circocele. Of these the most remarkable is an old omental hernia, whose commencement and history are not accurately known. In such cases, the omentum is often firmly attached to the cord by adhesion, the mass of the omentum becomes hard and irregular, and the veins varicose, from the constriction which they suffer in passing through the inguinal canal. In consequence of all these changes, a case of old omental hernia comes to bear a very near resemblance to a case of circocele, and has occasionally been mistaken for it by the most experienced practitioners. RICHTER has the candour to acknowledge that he has himself made this mistake.

Under a different form of attack, a mistake of an opposite kind has been committed, by the practitioner mistaking a case of circocoele for a case of omental hernia. When a circocoele, ascending upwards, enters and dilates the inguinal canal, it assumes an appearance similar to that of omental hernia. Accordingly, practitioners, misled by this imposing resemblance of symptoms, have had the misfortune of recurring to the disastrous practice of applying a truss for the cure of the supposed hernia. The pressure of the truss aggravated the complaint, by impeding the return of the blood through the spermatic veins.

The entrance of the circocoele into the inguinal canal produces a degree of dilatation which facilitates the descent of the

omentum. Accordingly, these two complaints have been conjoined with extreme inconvenience to the patient, from the impossibility of employing the palliative practice of supporting the hydrocele by a truss, without, at the same time, injuring the circocoele. This unfortunate conjunction is sometimes aggravated by the additional inconvenience of the hernia and circocoele becoming united by adhesions. In this case the omentum cannot be returned without dragging the circocoele along with it; on which account the case does not admit of palliation or of cure, excepting by an operation.

In general, however, a circocoele may be distinguished from a hernia, by placing the patient on his back, and emptying the swelling by pressure upon the scrotum,

then by pressing the fingers firmly upon the upper part of the abdominal ring, and desiring him to rise. If the case be a hernia, the tumour cannot re-appear so long as the pressure is continued on the abdominal ring; but if it be a circocoele, the swelling returns with increased size upon re-assuming the erect posture, in consequence of the return of blood into the abdomen being prevented by the pressure upon the abdominal ring.

Hydrocele of the spermatic cord is another disease which at times bears sufficient similitude to circocoele, to require an accurate examination of the symptoms to ascertain the true nature of the case. Both complaints are situated in the region of the spermatic cord, both are of a pyramidal figure, and both of a soft con-

sistence. But the condition of the hydrocele is not so much affected by change of position as the circocoele. It does not communicate a feeling at all like a bundle of convoluted veins, and it imparts a more distinct sense of fluctuation.

The causes which produce circocoele are not in general obvious, as it most frequently arises imperceptibly. Even in those cases in which a circocoele follows an accident or an attack of acute inflammation, it is not easy to trace the connexion between the cause and its effect. For, as a case of circocoele rarely follows a blow or an attack of inflammation, there must be something peculiar in the circumstances of the patient's constitution which favours the production of circocoele. It more obviously arises from excess of venery, especially in

early life, and from the practice of onanism, though, even from those causes, circocoele is not a frequent occurrence. Whatever impedes the return of the blood in the spermatic vein, is a strong predisposing cause, such as tumours in the spermatic cord, in the abdomen, or even a collection of indurated fæces in the colon. Any great derangement in the functions of the chylopoëtic viscera aggravates the severity of an existing circocoele, and predisposes to the disease.

The natural tendency of circocoele is to proceed with increasing severity. There does not seem to be any provision in nature to arrest the progress of the circocoele, far less to accomplish a cure. Yet, under all these unpromising conditions, with a perpetual aggravation of the symptoms, a

case of circocoele does not terminate fatally. It becomes, indeed, a most distressing complaint, which renders the patient's life exceedingly uncomfortable, and makes him willing to submit to the most severe remedy for the sake of obtaining relief. A very respectable practitioner accuses circocoele of ultimately producing a malignant affection of the testicles. But this does not seem established on a sufficiently extensive induction of facts. Circocoele, indeed, frequently produces a complete and incurable wasting of the testicles. Mr POTT relates an instance of both testicles being completely wasted from a severe attack of circocoele.

Circocoele can hardly be said to admit of a cure in its advanced stage. In the early stage of the attack, however, the hopes

are more encouraging. The first point to be determined, respects the expediency of taking blood. This practice, however, it is evident, is not applicable to those cases which arise from debility. M. PETIT mentions a case in which the patient was bled at the arm three times, with the happiest effect; and twice afterwards, in consequence of a relapse. In a case related by MR POTT, commencing with acute pain, detraction of blood relieved the pain, but did not prevent the subsequent decay of the testicles. But, in general, all that can reasonably be expected, is to palliate the sufferings of the patient, and to arrest the progress of the complaint, or, at most, to procure a partial and imperfect amendment. One principal indication of cure, in all cases of *circocele*, is to keep the testicle and scrotum constantly suspended,

which affords great relief to the patient. Greater relief still is obtained by keeping a horizontal posture, by which the inconvenience produced by the gravitation of the blood is avoided. The second indication is to increase the tone of the veins, which are relaxed in all cases of circoccele. This may be fulfilled either by general or local remedies. The application of cold is the most effectual remedy in both cases. Cold bathing, therefore, should be frequently practised, and cold solutions kept constantly applied to the scrotum. Occasional friction with stimulating substances, consisting of spiritous tinctures of various kinds, has likewise been employed with apparent advantage. The ultimate effect of the most judicious treatment, however, is seldom more than to arrest the progress of the complaint.

Internal remedies do good no farther than by contributing to support the health and strength of the patient. With this view, a proper regimen of diet and exercise should be strictly observed. The regulation of diet should have reference to the cause of the complaint ; since, when the complaint arises from the debilitating effects of onanism or excessive venery, the patient should be allowed abundance of nutritious diet. When the complaint is connected with plethora, or fulness of any kind, then a more moderate allowance of less nutritious food is to be preferred ; care being always taken to accommodate the regimen of the patient to the special circumstances of the case. But in all cases, articles of a stimulating quality are to be avoided, and the greatest

attention paid to keep the digestive organs in a healthy state.

Exercise must be taken in great moderation, since whatever accelerates the circulation of the blood, especially when the patient is in an erect posture, increases the varicose state of the veins of the scrotum. When medicinal treatment fails of procuring the expected relief, then no resource remains but an operation. Different operations have been performed, for the purpose of alleviating or removing the complaint. The most simple is the employment of some means to intercept the flow of blood in the spermatic vein. This object may be accomplished, either by applying a ligature to the vein, or by dividing the vein completely across. Sir E. HOME is, so far as I know, the first prac-

titioner in this country who, of late, applied a ligature to the spermatic vein. The practice was in a great measure successful, though, as another varicose vein remained unobstructed, it was necessary to repeat the operation. The first operation reduced the tumour to one half its original bulk, the second still more. The patient, in this case, suffered a great deal at the time the ligature was applied. I have known the same practice employed, with an equally favourable result, unaccompanied with any distressing symptoms. But, as the practice of applying ligatures to varicose veins has, in general, been laid aside on account of its severity and danger, this method of curing circoccele has likewise fallen into desuetude. Mr BRODIE cured a case of circoccele by dividing the vein completely across. The operation

was not followed by any violent symptoms, and the cure was complete. But whatever encouragement the success of those experimental cases may afford, our experience on the subject is still very limited. If the obstruction of the vein be the sole object in view, perhaps it may be accomplished with greatest certainty, and greatest safety to the patient, by the practice of applying caustic along the course of the vein. The application of actual cautery, as recommended by CELSUS, was employed in the Royal Infirmary, by Mr LISTON, with perfect success, the circocoele becoming indurated and impervious.

The operation next in order of severity, is the complete excision of the varicose vein. This practice seems chiefly adapted to those cases of circocoele, in which a single

vein is affected with disease. It was, in several instances, employed by M. PETIT with the most perfect success. In one case, the circocoele was as large as the scrotum. M. PETIT separated the tumour from the adjoining parts by a cautious dissection, taking care to avoid wounding the corpus pampiniforme, or the arteries of the testicle. He then divided the trunk of the vein which supported the tumour, and thus removed it completely, without injuring any other part of consequence. M. AMUSSAT, in a similar case, saw no prospect of a cure but in producing a wasting of the testicle by tying the arteries. This, however, was not easily accomplished, on account of the small size of the arteries, and large size of the veins. The operation was successful, but ought not to be rashly attempted, as it is neither

free from difficulty nor danger. BOYER observes, that all the proposed operations for the cure of circocoele are difficult to execute, and that, after all, the circocoele is apt to return ; so that circocoele may justly be regarded as hardly admitting of a radical cure.

Upon the supposition of circocoele being an incurable disease, it becomes a question of importance to determine the expediency of removing the testicle by castration. The removal of the testicle does not derange the other functions of the system ; and before the question regarding castration is suggested for consideration, it is in general useless as an organ of secretion. The patient, therefore, does not suffer any serious loss by submitting to castration. His own personal feelings must determine

the eligibility of parting with his testicle ; and the only question submitted to the judgment of the surgeon is the safety of the operation. In the present improved state of surgery, castration can hardly be regarded as a hazardous operation, excepting in cases where some unfavourable circumstance exists with regard to the patient's health, or in the state of the parts on which the operation has to be performed. Now, the presence of varicose veins in the spermatic cord is one of those unfavourable circumstances which render castration unsafe, from the risk of venous hæmorrhage, which it may be impossible to stop. This accident has actually happened in the hands of a most judicious and attentive surgeon. The state of the spermatic cord should therefore be particularly examined, before permitting castration for the cure of circ-

cele. There are a few cases in which the patient has requested the operation to be performed, and in almost all of them the practice has been successful.

THE END.







